

COLLEGIATE DRUG USE:
A NEW LOOK AT AN OLD ISSUE

Robert J. Chapman, PhD, editor

A PUBLICATION OF THE
NEW JERSEY HIGHER EDUCATION CONSORTIUM

Funded by the New Jersey Department of Human Services,

Division of Addiction Services

Project Developed by the New Jersey Higher Education Consortium on

Alcohol and Other Drug Prevention and Education

Distributed Through the Rowan University Center for Addiction Studies & Awareness

Acknowledgments

This monograph was produced by the New Jersey Higher Education Consortium on Alcohol and Other Drug Prevention and Education. Funded through the support of the New Jersey Department of Human Services, Division of Addiction Services, the N.J. Consortium was founded in 1987, and welcomes the participation of staff, faculty and students from all New Jersey institutions of higher learning. This document is part of a series of monographs from the N.J. Consortium to facilitate effective collegiate alcohol and other drug prevention. The N.J. Consortium is housed at the Rowan University Center for Addiction Studies, Glassboro, N.J.

Special thanks are expressed to Commissioner Jennifer Velez, N.J. Department of Human Services, Division of Addiction Services and staff, including Raquel Mazon Jeffers, Director, Alysa Fornarotto-Regenye, Strategic Prevention Framework Manager, Jay Harper, Ph.D., Dean of the College of Liberal Arts and Sciences, Rowan University; and Albert G. Frech, Ph.D., Director, Counseling Center, Ramapo College, Former Chair of the N.J. Higher Education Consortium and Regional Coordinator of the Network of Colleges and Universities Committed to the Elimination of Drug and Alcohol Abuse.

For more information concerning the New Jersey Higher Education Consortium, please contact the Center for Addiction Studies, Rowan University, Alvin Shpeen Hall, 40 N. Academy Street, Glassboro, N. J. 08028. All consortium meetings are open and interested members of the higher education and local communities are invited to attend.

Linda R. Jeffrey, Ph.D., Emeritus
Center for Addiction Studies & Awareness
Rowan University
856 863 2175
Fax: 856 863 2169
ljeffrey@comcast.net

Pamela Negro, MSW, LCADC, Director
Center for Addiction Studies & Awareness
Rowan University
856 863 2175
Fax: 856 863 2169
negro@rowan.edu

DeMond Miller, Ph.D., Director
Liberal Arts and Sciences Institute
Rowan University
856-256-4500 x4525
Fax: 856-256-4423
Millerd@rowan.edu

Table of Contents

21 st Century Collegians: Same Church, Different Pew.....	4
<i>By Robert Chapman, Ph.D., Drexel University</i>	
To the edge and back again: Edgework and Collegiate Drug Use.....	24
<i>By Thomas Workman, Ph.D., University of Houston- Downtown</i>	
After Alcohol, Those Other Drugs that Your Students Use.....	49
<i>By Brian A. McMillen, Ph.D., East Carolina University</i>	
Prevention Strategies for Prescription and Other Drugs on College Campuses.....	78
<i>By Valerie LaMastro, Ph.D., Rowan University</i>	
I Said No to Drugs...But the Drugs Wouldn't Listen!.....	93
<i>By Michael P. McNeil, Columbia University</i>	

21st Century Collegians:
Same Church...Different Pew
Robert J, Chapman, PhD
Drexel University

Introduction

Have you ever found yourself suddenly aware that you have no recollection of having driven the last few minutes/miles on an Interstate? I'm not asking if you are an alcoholic who has emerged from a blackout while driving, but who among us cannot admit to occasionally entering that "zone" induced by the rhythmic "bump thump, bump-thump" of tires crossing pavement segments or the constant hum of the tires on the tarmac or metronomic beat of wiper blades on a rain streaked windscreen?

While cruising down the Interstate, the "auto pilot" switched on and in full control, a driver can literally travel miles with absolutely no awareness of the journey...signs are ignored, exits missed, scenery passes unnoticed. It's only when called upon to negotiate a particularly challenging situation or encountering an unexpected road hazard that we are catapulted back to the present, often with a start that rivals a 100 joules from the ER doc's paddles. Complete with a white-knuckle death grip on the steering wheel and a flood of adrenaline that renders muscles beyond rational control, the driver is momentarily little more than a passenger hurtling through space.

Those of us in higher education in general and, more specifically, senior administrators and student affairs professionals addressing alcohol & other drug-related issues may well have entered such a "zone" as we have "cruised" from one academic year to the next, barely noticing the changes between academic classes let alone the generations of students who matriculate on our campuses. If this is true, we best prepare for the wake-up call that will jolt us back to the present, and that call is being placed by the millennial generation.

As the first decade of the 21st Century draws to a close, the understanding of what it means to be a contemporary student in an American college or university has never been more unclear for the faculty and student affairs professionals of these contemporary institutions of higher education. Traditionally aged collegians are not like the Baby Boomers—the generation born between 1946 and 1964—or Generation X, which is sometimes called "Gen-X"—its successor.

Millennials, as those born roughly between the years of 1980 and 2000 are called, tend to look at the world through a different set of lenses. To place this disparate nature into perspective, consider that many administrators, faculty, and trustees of America's colleges and universities are at least members of Generation X if not Boomers themselves, making them the chronological equivalents of the parents if not the grandparents of today's student. Although this is not a new phenomenon as faculty and administrators have always been one if not two generations the senior of their students, faculty and administrators in the 21st century who set policies, design curricula, and minister to the needs of present-day students see the world through their own set of lenses that have been ground to a specific prescription dictated by the culture into which they were born and influenced by the technology then available to them as they negotiated the demands of late adolescence and life as a college or university student. However, if the generational difference between students and faculty/administrators is nothing new, the differences between the generations today are considerably more dramatic than those that have separated the generations of adolescents from their parents and grandparents for millennia, if you will, the so-call "generation gap." The differences between those who administer institutions of higher education, instruct their students, and oversee student life outside the classroom as well as the contemporary collegians who are entering these institutions in the 21st century are representative of nothing less than a major paradigm shift of historical proportion.

It can be argued that there have been two major technological paradigm shifts in Western Civilization during the last thousand years, shifts that have been so profound as to have resulted in a complete restructuring of Western civilization. The first was heralded by the invention of the printing press in 1440. Its moveable type, the actual press itself, and oil-based inks permitted, for the first time, the mass production of "printed" books. This technology afforded the opportunity for the wide scale dissemination of information and ideas and all but single handedly ushered in our modern system of education. The printing press enabled "knowledge" to be placed in the hands of the common person. It opened the door for everything from an individual consideration of the "word of God," directly and without necessitating clergy to interpret "His Word," to the distribution of individual treatises that kindled political revolutions, toppled governments, and forever changed the world and the balance of power in it—think Martin Luther (Protestant Reformation), Thomas Payne (American Revolution), and Robespierre (French Revolution), and the list is all but endless.

The second technological shift of the past thousand years that reshaped the Western if not the entire world and forever changed the course of its cultural evolution was the industrial revolution. The advent of the technology that enabled humans to harness the forces of nature and

permit human insight and inspiration to generate tangible products produced in quantity converted a basically rural, agrarian people of the 16th and early 17th centuries into an urban, industrial society. The impacts of this second wave of technological change are still being felt as no less than 50% of the world's now 6.6 billion inhabitants reside in its cities and urban centers.

To expand upon and consider these sociological phenomena in detail is beyond the scope of this introduction, but they do suggest that there have been events, initiated by the invention and development of new technology, that have resulted in irrevocable changes in the way we function as a people. In short, these technological changes have been so profound as to reorder the world and how its inhabitants view themselves, each other, and their relationships with each other not to mention their impact on its physical environment. It would appear, as we progress toward the second decade of the 21st Century that we are once again experiencing such a technological shift. It is entirely likely that in another 25 to 50 years, historians will consider the period from the mid-twentieth century through the mid-21st century as yet a third major era when a technological shift forever changed the world. This third and most current technological shift is the digital revolution.

Currently we are likely in the midst of the sociological shift that accompanies this third technological upheaval. As is so often the case when phenomena of such historical significance unfold on a day-to-day basis over decades, one is rarely aware of the historical significance of the era in which he or she lives. Like trying to watch your beard grow by staring in the mirror after shaving, it is difficult to perceive change that occurs constantly as it is happening. Recognizing the significance of a specific event let alone the age it ushers in is a challenge for social scientists not to mention ordinary collegiate administrators. It is not until after an event has become history and we can look back over one or more decades that the significance of the age just past begins to come into focus. Born of technological innovation, the current digital age as we are coming to refer to the present is transforming society as we know it, perhaps even more profoundly than did the printing press in the 15th century or industrial revolution in the 18th & 19th.

The impact of the digital age is evident in many aspects of contemporary life and perhaps nowhere more so than in its impact on higher education and in particular, the day-to-day lives of contemporary collegians. This technological shift can be viewed as a *digital revolution* as we see the ever-expanding impact of digital technology—and in particular the computer microchip—on both the world in which we live and the individual lives of those who live in that world. This impact is masked as we have become all but unaware of the changes happening around us on an almost weekly basis. These advances in digital technology and their impact on everything from

medicine and engineering to personal entertainment and communication have in essence become expected. It is this expectation of the next digital advancement in technology that not only blinds us to the significance of the age in which we live, but desensitizes us to the significance of these changes and their impact on our culture. It is this last area that is of greatest significance when attempting to fathom just how different contemporary collegians are from the faculty and the administrators who operate the institutions of higher education in which they are currently matriculated.

Difficulty recognizing and appreciating change...from year to year let alone generation-to-generation...is nothing new. Countless works of art and literature, not to mention the popular culture, are rife with generational change as a preeminent focus. But as constant as change may be, when a technological advancement of the proportion of the printing press in the 15th century or the industrial revolution of the 18th and 19th centuries come along, society as we know it is forever changed. Be it the Protestant Reformation and its impact on Europe and the colonization of the “New World” or the urbanization of Western society, it is clear that the introduction of new technology and the ideas it gives birth to irrevocably change the social structure of the cultures into which they are introduced. This is no more clearly evident than in the currently unfolding impact of the digital revolution on the contemporary college and university students who will become, as the cliché goes, future scientists, educators, artists, and practitioners of all descriptions.

Although each year we are treated to the latest iteration of the Beloit College *Mindset List*, which presents a humorous if not sociologically significant look at students entering higher education—the most current as of these being for the class of 2011 (see <http://www.beloit.edu/mindset/2012.php> last visited 16 October 2008)—it is easy for contemporary educators and student affairs professionals alike to lose sight of the almost incomprehensible difference that exists between the matriculating students in the collegiate class of 2012 from those of the class of 1991—when Gen-Xers were graduating—not to mention the class of 1971 in the midst of the Boomers graduation from college and university. Not only were the trappings of contemporary life for these disparate groups at issue, each group’s understanding of the process by which education took place and how knowledge was conveyed and acquired was fundamentally different from the way contemporary collegians envision this process.

Although the college graduates of 1971 and 1991 have had, by necessity, to become familiar with computers, cell phones, the Internet, and “all things digital,” this familiarity has been acquired much like one acquires a second language, and is used in much the same way...to survive or function as a stranger in a strange land. Comparatively speaking, not many 1971

collegiate graduates are the equivalent of fluent in “digitesse” whereas every student in the class of 2012 has grownup with video games, “everything online,” cell phones, and thinks nothing of having to interface various electronic resources in order to engage in an interactive virtual relationship with “friends” from around the world. Perhaps Thomas Workman (2008) of the University of Huston-Downtown, who has a chapter later in this monograph, said it best:

Many of our current students have enjoyed digital play from early childhood; computer games and sites with personalized, interactive features have been popular for some time. Unlike the Xers and the Boomers, however, millennials have matured alongside the technology. For millennials, the growing sophistication and capacity of the Internet has been entwined in their own maturation process to the point where it is difficult to determine the degree of influence one has had on the other. Few millennials marvel at technological advances in the same way that older generations do – new technological capacities are simply expected as routine. (p. 2)

Today’s technologically astute student is not only familiar with this technology; he or she is lost without it.

Summary

Change is nothing new, but there have been several technological changes in the last thousand years that have been so profound as to have altered the evolution of Western society as we know it. It would appear that we are currently living in another of these technological upheavals that, although difficult to appreciate as we live it day to day, is transforming the culture on college and university campuses at such an alarming rate as to have created a serious disconnect between faculty and administrators and the students matriculated in their institutions of higher education. The contemporary college or university student of the second decade of the 21st Century sees the world through an entirely different set of lenses than do the faculty and administrators of their institutions who negotiated their own journey through the maze of higher education one if not two generations previously.

Understanding the Millennial Generation

Let’s step back from the millennial generation’s ostensibly seamless interface with “all things digital” and consider some general characteristics of this population of contemporary collegians. Members of this group choosing to enter college or university started doing so in approximately

2000 and will be our “contemporary collegians” through at least 2020—a somewhat metaphoric date that seems to admonish student affairs professionals and collegiate faculty alike to sharpen their vision and pay close attention to just whom we are educating.

Regarding the family, *boomers*, those born between 1946 and 1964—the *TV generation*—were raised with the stereotypical view of the nuclear family reminiscent of the Cleavers in *Leave it to Beaver*, *The Dick Van Dyke Show*, or *Father Knows Best*. Mother worked at home, wore dresses, cared for the children, and prepared a dinner that was eaten by the entire family when dad returned home from work; right was clearly right and wrong was something that was never done by regular people and if it was, would promptly result in appropriate consequences. There were generally two adults...of opposite genders...who were the biological parents of the children in the story line. Two of the more popular exception to this formula were *My Three Sons* where the dad was a widower and assisted in raising his sons by “Uncle Charley,” dad’s uncle, and *The Danny Thomas Show (Make Room for Daddy)* where again there was the traditional nuclear family, but the first introduction of an “extended family”—Uncle Tonoose—albeit something that was more indicative of the culturally different Williams family—Lebanese—rather than a broadening of the American portrayal of a “typical” family.

For Gen-Xers—those born between 1964 and 1980—this view of the “typical” family changed somewhat, in order to keep up with the times. The standard for the American family became *The Brady Bunch* where mom and dad were still married to each other, but their children were “hers, his, and theirs” as we were introduced to one of the first blended families proffered as “mainstream” in primetime TV. As interesting as these changes in the make-up of the iconic American family may have been, there was a consistency regarding “family values” that governed the lives portrayed by these scripted offerings of Americana.

When considering the American family as portrayed to our millennial generation students we begin to recognize a distinct shift in both the makeup of the family and the values by which these families operated. Whether the ethnic-focus provided by the Evans family in *Good Times*, the banal middleclass existence of the Bundies in *Married with Children*, the atypical family scenario of *My Two Dads*, or 90’s version of the Boomers’ stereotypical view of “the family” albeit with professionally working mom, *Family Ties*—and there are many more examples of these “varied” families that were presented to millennials as “typical”—millennial generation students were exposed to a variety of different family constellations and led to believe that such shows represented the playbooks from which normalcy in familial life could be discerned. One show, perhaps more than all others combined, has infused the millennial generation with an

understanding of family, community, religion, politics, and all other manner of “social values,” *The Simpsons*.

In qualitative research conducted by Sanford and Haworth (2002 – see <http://www.collegevalues.org/articles.cfm?a=1&id=613> last visited 16 October 2008) the authors found that contemporary students who came from families considered “typical” by Boomers looked at themselves as *atypical* having been raised by two adults of opposite genders, still legally married to each other and who were both their biological parents. Whether it was the portrayals of the American family in the popular culture that influenced these student perspectives or their experience interacting with peers who came from other families of origin that differed from the mid-20th view of typical is essentially irrelevant to this essay. What is pertinent is that these children are *our* students. Along with their understanding of “reading, writing, and ‘rithmetic,” they bring their views and values regarding family—and their roles in those families—to campus with them.

And if the understanding of “typical,” regarding the contemporary collegiate views on American family has changed in the last two generations, then the role that the parents of these contemporary students play in the lives of their children when they enter college or university has changed as well.

Summary

Millennial students have been exposed to a myriad of different views regarding family, contemporary culture, and what constitutes “typical” in American culture. This shift in the perception of what constitutes, normal serves as a cultural backdrop against which we begin to grasp the depth of difference between contemporary students and the faculty and administrators who minister to them in college and university.

Parents of the Millennial Generation

Darby Dickerson (2008), in her excellent consideration of *Risk Management and the Millennial Generation* (copy available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1093684 last visited 16 October 2008) speaks to these issues as she ponders the impact of digital technology on the relationship between contemporary collegians and their parents. Millennial students report being in contact with there parents several times each day. Between cell phones, instant messaging, “texting,” and email, the “once a week if you were lucky” five-minute phone call

home from Boomers when they were in college or university seems like estrangement compared to the contact contemporary collegians maintain with their parents. As the testimony of faculty and administrators of contemporary institutions of higher education besieged by contacts from the parents of matriculated students will avow, students turn to their parents—whom they frequently describe more as friends who provide support and with whom they can commiserate than as parents whose role it is to mentor and advise them as they learn to navigate the problems and disappointments of transitioning to adult life—to fix their problems rather than advocate that they deal with their concerns themselves.

Dickerson goes on in her essay to outline how contemporary students have essentially learned what they have been taught. They have lived not only what many would call a privileged life as exemplified by the absence of hunger, access to medical attention, and residing in a safe and comfortable home...not to mention its private bedroom and bath, the personal cell phone, access to cars, and disposable income...but a sheltered life as well. Millennial students have *always* been sheltered and protected...at least those from the dominant culture. If it was not the government regulated safety features in public transportation, it was mandatory bike helmets, fire-retardant clothing, elaborately constructed child safety seats for cars, and mandated immunizations that fostered this sense of security and entitlement. As logical as any one of the myriad safety precautions to protect children may be, together they have created an expectation of safety and security that does not foster autonomy. Like the 1960's poster found on the dorm room wall of many a Boomer, "Give me a fish and I eat for today; teach me to fish and I will eat for a lifetime." Carry this adage to the 21st Century, today's students have come to expect to always be fed rather than have had to learn how to provide for themselves.

The more parents become involved in the day to day machinations of their children the less prepared these students are to take their place in the director chair of their lives. Each time a student turns to a parent to complain about a grade or inability to get into a popular course—or more to the point, each time a parent accepts the responsibility to fix the perceived problem the student foists upon him or her—the greater the problem of students developing a sense of personal identity and independence becomes. And this problem of parental involvement in the mundane aspects of student lives, what has been labeled as the "helicopter parent," has been facilitated in no small part by the digital expectation of instantaneous communication with mom or dad. A case in point: While recently co-leading a group of students on a study tour to the Netherlands, a student called her father in the U.S. to ask directions to a desired location in Paris, where she would be traveling with friends the next day. Granted, the father was familiar with Paris, but the point remains that her first thought—and perhaps only considered option—to address the dilemma of finding directions to a desired site in Paris was to call home to the U.S. and ask dad.

Referring again to Tom Workman's (2008) previously cited presentation at the 29th Annual National Conference on Law and Higher Education Stetson University College of Law, the issue of "anticipated reciprocity" or the student expectation that not only will a parent/professor/*anyone* respond when digitally contacted by a student, but that this response will be virtually immediate has furthered the student propensity to deflect responsibility to deal with the curves pitched by life.

Individuals who participate in online communities believe that they will receive reciprocity for their efforts. Someone will write back. A posting will be followed by comments. By the very nature of the technology, response and reciprocal disclosure are part and parcel to the experience. Instant messaging, cell texting, even YouTube uploads result in immediate gratification – a response. Faculty often complain that students expect immediate response to their e-mail inquiries, not realizing that such non-reciprocation is equivalent to ignoring a passer-by who says hello. Many students of the millennial generation feel they are entitled to some reciprocation, and are unhappy when a professor or staff member speaks but won't listen or demands high-quality work but won't share full feedback. If live community is to compete with virtual community, we'll need to take a lesson from the technology, and create reciprocity in our offline interactions with the generation. (p. 8).

Like immediate gratification, expecting—and receiving—an almost immediate response to a question, request, or problem preempts students from learning to address issues themselves. Hara Estroff Marano, in her 2004 essay in *Psychology Today* (Nov/Dec 2004) entitled, "A Nation of Wimps" (see <http://psychologytoday.com/articles/pto-20041112-000010.html> last visited 16 October 2008) suggests that parental assurance of attention, success, and/or the opportunity to always participate in an event irrespective of talent, ability, or appropriateness robs a child of the opportunity to learn the important life skill of dealing with disappointment. With scheduled play dates and parents who confront team coaches who do not provide enough "game time" for a child whose ability may be other than that needed during a particular event to ensure success for the team, contemporary students have been raised to expect that an advocate will fight their battles, ensure success, or affect retribution in the event the student has experienced anything less than success. In an age when not only the team winning an event receives a trophy but also *everyone* on the team, contemporary students have learned to accept not only an immediate response to their digital overtures, but a response consistent with their expectations.

Summary

Contemporary students are among the most privileged and protected Americans in the history of the country. They have come to expect that their needs will be met as parents provide for them or see to it that others do. Such students have come to view faculty and staff in college and university as service providers and when the anticipated or desired service is not provided to the student's liking, provided in an untimely manner, or outright denied, to immediately take their concern to a parent rather than pursue it directly with the individual involved. This pattern of behavior, perhaps more than any other, is responsible for the sense of entitlement that many contemporary students have and the shift in their relationship with parents and the institutions of higher education to which they matriculate.

Profiling the Millennial Generation

In his 2006 publication for the University of Nebraska at Lincoln entitled, *Get to Know Me* (available for download at <http://www.retain.unl.edu/GetToKnowMeBook.pdf> last visited 16 October 2008), Thomas Workman distilled dozens of hours of focus group conversations with more than one-hundred contemporary collegians into one cogent and amazingly frank look at 21st Century students. He is quick to point out in his forward to this publication that while we must recognize that traditionally aged contemporary college and university students begin higher education prior to having completed the developmental process, they nonetheless do so having learned what they have been taught by the culture in which they have been raised.

The culture of contemporary America in the first decade of the 21st Century is one that has championed consumerism, prepped its next generation to be vigilant as regard the market economy in which it is developing, and above all, aware of the commercialized environment in which we now live. Such consumer-based life skills are the product of living in an age when one cannot watch a program on TV or see a film in the theater without being inundated by product branding. It is no wonder that these students begin their collegiate careers having approached the decision about which institution of higher education to attend in much the same ways they have chosen their cell phones, CD players, and clothing...what's cool, what's in demand, what's the cost.

Having noted this, it is also important to recognize that much of what is known about these contemporary students, while likely applicable to many, is not necessarily indicative of all members of the millennial generation. It is uncertain if the profile of these collegians is equally representative of contemporary students of color or those representing other minority populations

on campus. Although it is true that even these students on today's college and university campuses have been exposed to the same influences of the popular culture, as have their peers from the dominant culture, it cannot be assumed that its impact has been the same. Likewise, social scientists have known for some time that intra-group variance can be even greater than inter-group variance (Scierra, 1999). For this reason, it is important to avoid stereotyping contemporary collegians as it is clear that they vary as much from one individual to the next as can be seen in any cultural or ethnic group. Yet it remains that there are certain commonalities that exist among a sizable portion of contemporary college students who represent the millennial generation and these students can affect how all students are perceived and served by the faculty and administrators responsible for shaping the collegiate environment in which they live, study, and socialize.

At the same time administrators and faculty need to avoid stereotyping students, there are characteristics of the contemporary majority student that need to be considered. As a group, these students have come of age in a time when exposed to far greater protective factors than has been the experience of any previous generation in history. Where members of the baby boom generation pedaled their bikes without helmets, drank water from a garden hose, and rode in the front seat of the family car unrestrained by seatbelts let alone ensconced in child-safety seats reminiscent of NASA test equipment, today's collegian was raised in an environment punctuated by mandated safety regulations governing protective measures ranging from automobile crash test standards, mandated airbags and seatbelts laws for the cars in which they were riding to flame retardant clothing, electric outlet covers, and parental regulation designed to protect them from the least likely of harms. Millennial students have never slept in a crib painted with brightly colored lead paint; they have had mandated immunizations prior to being enrolled in elementary school; likely lived in homes with cupboard door locks, edge and corner guards on furniture, and carbon dioxide detectors, and have little idea of what asbestos is let alone lived in or attended school in a building where it was a principle building material. In short, "millennials" are the most guarded and protected generation in history. Yet with all these efforts to assuage the risks of childhood, this generation has nonetheless witnessed the attacks on the World Trade Center and U.S. Pentagon in real-time, seen reports of schools shootings become unremarkable regular news reports, and found itself living in a world in many ways punctuated by violence.

Contemporary American students begin their post secondary education squarely at the confluence of mandated protective factors, unprecedented consumerism, and global political instability. These variables in the lives of today's collegians result in several personality characteristics that can impact their collegiate experience. Borrowing again from Workman (2006) who cites Debord (2004), these include:

- Feeling special – that they can do anything and be anyone they want to be
- Being sheltered and expecting to be safe – protected from birth by parents and school
- Being confident – they are rewarded for all that they do with grades, awards, and omnipresent praise
- Acting conventional - Tradition and ritual, along with family and community, have been themes given to them since birth
- Being team-oriented – they have been placed in teams since birth and taught to pursue competitive goals thusly
- Being achievers – presented with endless opportunities, they have come to expect success as they pursue personal goals
- Feeling pressured – stressed by an uncertain economy and uncertain global stability, they have become *multi-taskers* who believe they must “do it all” lest they fail

Such characteristics present contemporary educators with challenges previously outside the purview of faculty and academic administrators—how to approach a student body that views education as a commodity to be purchased rather than a goal to be achieved. And as if this was not challenge enough for contemporary educators, these students and their parents are demanding a safe and sheltered environment in which to pursue the promises of the consumer-driven society in which they live. Consequently, this has necessitated the need to entertain as well as educate a student body for which both of these objectives are perceived as the entitled rights of *customers* who have contracted institutions of higher education for an academic degree.

Ironically, many contemporary educators recognize these characteristics of the millennial student, but choose to *react to* them rather than *act on* them. This results from an all too frequent misperception of these student characteristics as indicative of students who are—and again citing Workman (2006)—, “spoiled, childish, whiny, and ignorant of the larger educational institution and its goals.” Such views of contemporary students result in programming that tends to be more intent on bringing students to an ideological place that faculty and administration believe they *should occupy* rather than embracing the reality that it is an institution’s responsibility to meet its students where they may happen to be—intellectually, socially, ideologically—at the time they matriculate on campus.

This is the classic challenge faced by all facilitators of change—and the experience of contemporary collegians is nothing if not an lesson in change—namely, do you attempt to push the student towards what he or she should know or be doing upon entering college, or do you accept that individual student where he or she is intellectually, socially, and ideologically and

attempt to motivate change as the personal choice of the student...an “inside job” if you will? As Sandra Anise Barnes once wrote, “It is so hard (to change) when I have to, and so easy when I want to.” This is the challenge faced by educators in the 21st Century...how will the pursuit of change by contemporary collegians be addressed and do you push student towards what you want them to know/do or motivate them to pursue these objectives of their own volition?

Summary

Educators and their clients—students and their parents—are at odds regarding each other’s role in facilitating the receipt of a college education by members of the millennial generation. The “disconnect” is palpable as the end of the first decade of the 21st Century draws to a close. Students and their parents look at institutions of higher education as contractors who enter into an agreement to provide a post secondary education in exchange for an exorbitant fee; educators look at students’ expectations of higher education as misguided, myopic, and self-serving if not hedonistic. The challenge that faces administrators and faculty serving contemporary students is whether to, as William Miller asks about counselor interaction with a client, “wrestle or dance” with these students.

But what of the Nexus of Millennials and Drug Use?

The use of prescription and illicit drugs (other than alcohol for those under 21) has been of concern to many in higher education for sometime—see Lucey’s (2006) chapter in *When they Drink: Practitioner views & lessons learned on preventing high-risk collegiate drinking*, (<http://www.community.rowancas.org/node/21>). Although it is true that alcohol is the drug most frequently associated with collegiate use, it must be acknowledged that the use of prescription medications and illicit “street drugs” by contemporary college and university students is an issue of equal concern for administrators in the 21st century. With marijuana the most frequently reported illicit drug used by students (some estimates suggest use by approximately one-third of college students at least once during the previous year), use of prescription meds and illicit substances like cocaine, methamphetamine, and heroin are generally reported in the low single digits.

As regards the use of prescription medications—by both those for whom the meds were prescribed but used in ways other than intended and/or by others for whom the medications were not prescribed—and those reporting the use of illicit drugs represent a very small minority of contemporary students. Many intelligent but uninformed adults seem to view drug use by college and university students as more widespread than is actually reported by students. Nonetheless, drug overdoses or student suspensions if not expulsions for violation of institutional drug

policies quickly become common knowledge and contribute to the misperception that drug use by collegians is prevalent.

Students look at events where a peer is “caught” using or is in possession of an illicit substance as “bad luck” or the result of “being stupid” in choosing where and when to use. They dismiss such occurrences as happening to “somebody else,” but never to them. Yet, given the frequency of announcements about and attention devoted to the risks associated with the use of illicit substances, how do we account for their continued use irrespective of the relatively few students engaging in such behavior, especially on a regular basis? Potential answers to this question can be identified at both the individual and group level.

While the minority of college students who choose to use drugs do so infrequently and/or in small quantities, there is a phenomenon described by social psychologists that may offer an explanation as to why some students engage in such behavior in spite of the social, academic, and/or personal risks. Social Psychologist Melvin Lerner described in 1980 a belief system that drives the way humans evaluate events in their world. Commonly referred to as the “just world hypothesis,” this belief can be heard in statements like, “People get what they deserve.” This may explain why the average viewer of the six o’clock news can condemn arrested suspects simply because they were arrested, i.e., “They must be guilty or why else would they have been arrested? They got what they deserved,” or how someone unfamiliar with collegiate life can say something like, “college kids...they are supposed to be studying, not partying.” But this does not explain why college students can attend parties, witness some of their peers using drugs, some experiencing negative judicial consequences, and *then proceed to engage in the very same behavior themselves*, and act surprised if caught. Or does it?

If we look at Lerner's original hypothesis, one loose interpretation is the belief that, *bad things happen to bad people*. This, by association, implies that good things then must happen to good people. Applied to the millennial college students who have been told since birth that they are special, destined to accomplish whatever he or she puts his or her mind to and we can hypothesize that most if not all contemporary college students consider themselves to be “good people.” It is therefore not an inconceivable reach to conclude that “bad things” cannot possibly happen to them. While Lerner originally offered his hypothesis as an explanation of why the observers of human behavior draw the conclusions they do about the observed other, this hypothesis may well offer us some insight as to why students who choose to drink abusively do so, that is, bad things cannot possibly happen to me because I am...a good person. Put succinctly, if bad things happen to bad people and I am a good person, then I am immune to the untoward consequences of my behavior, what student affairs professionals sometime refer to as perceiving themselves to be, as contemporary students are fond of saying, *bullet proof thinking*.

Although most frequently seen in cases of troublesome collegiate drinking, this is also the case for those students who choose to use illicit drugs.

As Lerner's *just world hypothesis* may suggest a possible explanation for individual incidents of illicit substance use, the more spectacular examples of dangerous student behavior invariably involve group behavior, for example, the student that would never make a solo decision to use an illicit drug but becomes an unwitting user when presented with the opportunity to do so in a group. What contribution does the group in which one socializes make in these choices? Social psychology offers views that may help explain the process present in these occurrences as well.

Irving Janis, another prominent social psychologist of the 20th century, coined the term "groupthink" in the early 1970's to explain a phenomenon of group decision-making. He observed that when the leadership influences an organized group, isolated from a main stream of thinking on a particular issue, poor decisions tend to result when the group is placed under stress. The hallmarks of such decision making include a group's belief that it is invincible and has moral charge to act in a particular fashion—anyone familiar with collegiate social life can see how this may apply. There is also a propensity to view individuals outside the group as "others" and to justify such by employing stereotypes. When the group employs a buffer that protects it from outside influence on its decision-making—a buffer that tends to censor contrary or alternative view to those expressed by the group and its leadership—individual members are pressured to *fall into step* and go along with the decision of the group. The use of illicit substances, or for students of age, alcohol, results in mild to severe intoxication, which can further muddle this entire process of group decision making. In this situation, the normal checks and balances employed in decision making are no longer in force.

Another force at work for students in groups is the pressure to conform, a force at work especially for membership groups like Greek-lettered organizations. Students may agree to behavior or the performance of acts that they would not initiate alone simply to avoid being labeled as deviant, that is to say, odd, strange, or *uncool*. Fear of social disapproval is a very salient feature for college students, a phenomenon Stanley Schacter demonstrated very early in social psychological research. As this research showed, it is difficult to resist the remonstrations of a group if you are choosing a course at variance with that group. The implications are clear for students wanting to be accepted as a member of such a group.

Students pledge Greek-lettered organizations, attend keg parties, play drinking games, accept high-risk challenges and dares, and do so all in the belief that this is SOP—*standard operating procedure*—for collegiate life. Given these arguments, the question may be why MORE college students do not use illicit substances or experience consequences associated with such behavior rather than why we only see as much of this behavior as we do. Be that as it may, as counselors and educators and administrators, what are we to do?

A proactive response to this question may be to consider employing strategies used to address underage and troublesome drinking on campus, thereby learning from our field and how to yield agents for changing individual and group processes. Colleges and universities across the country are heeding the call to engage in environmental strategies designed to curb the incidents of high-risk student behavior...and these efforts are working. The problem is that as institutions of higher education succeed in reducing high-risk drinking *on campus* students take their illicit drug-using behaviors further and further *off-campus*. Here in lies the rub; until and unless students revisit their belief that they are *bullet proof* and/or have the right to party in whatever way they choose, we will continue to see a minority of students persist in choosing to use drugs. It is in this area that we may see one significant characteristic of the millennial generation having the greatest impact on the use of illicit drug; their views on rules, regulations, and imposed restrictions on their perceived rights.

Summary

Human behavior tends to be motivated by an internally perceived association between a particular course of action and the perceived likelihood that pursuing that path will result in an increased chance of receiving a desired reward. When observing the behavior of others, we have a tendency to attribute their actions to circumstances consistent with our views. Students of the millennial generation have been taught to believe that they live in a safe environment where the likelihood of harm befalling them is minimal. In addition, these are students who have been raised to believe that they can accomplish anything and, therefore, they are entitled and, if you will, “good people.” It is therefore difficult for students like this to perceive an untoward risk being associated with the use of illicit substances because things like that “just don’t happen to them.”

Engaging the Millennial Generation: Who's Driving the Bus?

Peter Lake, a professor of law at the Stetson University’s College of Law and a well-respected authority on the rights and responsibilities of the modern university suggests that members of the

millennial generation tend to be “vampires and dodgers.” This quote, from Darby Dickerson’s (2007) essay on risk management and the millennial generation cited earlier in this chapter suggests that millennial students may be “vampires” in that they do not start socializing until 10 PM and frequently remain out or at least up until the early hours of the morning. They are “dodgers” in that they are familiar with authority and its policies, however, feigning compliance in its presence while all the time acting independently of it when unobserved. To quote Dickerson directly:

Millennials adapt quickly to new structures. Although Millennials tend to respect authority more than the Boomers or GenXers, they also trend toward rule avoidance. They are artful dodgers. They are able to master rule systems and quickly identify ways to work around those rules or to comply with the technical letter of the rules while evading their spirit (p. 4).

Ironically, it is the tendency of Boomer and Gen-X administrators to address such troublesome student behavior with ever restrictive codes and policies, often requiring complicated and time-consuming vetting processes that permit students sufficient time to manipulate collegiate systems so effectively. Like an accomplished defense attorney who has learned to exploit the loopholes in the criminal justice system to acquit a guilty client, students of the 21st Century are aware of and manipulate the loopholes in an institution’s policies to their personal advantage. And when unsuccessful and conducting such an end-run around a particular policy, the tendency is to call foul and involve parents in an effort to extricate themselves from the consequences of their behavior.

Returning again to the role of parents in the lifestyle of millennial students, the relationship between them is at the same time important, intimate, and not necessarily productive as regards teaching life skills. Whereas a mere insinuation of misconduct by a collegiate authority would cause the parents of a boomer to administer parental consequences for their child’s errant behavior, the parents of a millennial are just as likely to confront senior administration if not the president of the institution about its arbitrary and capricious policies and their enforcement, perhaps threatening litigation if the issue is not rectified.

When a college or university degree is viewed as a commodity to be purchased rather than an accomplishment to be earned, students and parents both tend to look at policies and procedures

both in and especially outside the classroom as being more like the fine print on a consumer contract than the boundaries that define decorum in an 21st Century institution of higher learning.

It is difficult to determine if the expectations of millennial students shape the behavior of their parents or if it is the propensity of these parents to intervene and arbitrate on behalf of their children, perhaps in advance of knowing all the circumstances surrounding the child's reported dilemma that supports the expectation of the student. In many ways, this is irrelevant as the resulting demands of both students and their parents result from a sense of personal entitlement that is endemic in today's relationship between institutions of higher education and their "customers."

What is of significance when considering such current trends in higher education is how the attitudes, values, beliefs, and behaviors of students and/or their parents may impact the drug use behavior of individual contemporary collegians. Whereas substance use, both drinking alcohol and consuming other drugs is nothing new for students in college or university, what is dissimilar and therefore of great significance as regards millennial students is the way these substances are used and, more specifically, the reported intent to become intentionally intoxicated when students decide to imbibe. No longer is intoxication essentially the byproduct of an inexperienced user consuming too much too fast or mixing alcohol with some other psychoactive substance. Many contemporary students report use for the expressed purpose of becoming intoxicated¹.

Suggestions for Reading the Remainder of this Monograph

This introduction to contemporary collegians—the *Millennial Generation*—is intended to create a platform from which the reader can consider the chapters that follow. These fall roughly into four categories:

- Drilling down deeper into the characteristics of contemporary collegians in order to better understand why some of them may choose to experiment with if not regularly use illicit

¹ For more on student expectations regarding alcohol specifically, see volumes one (<http://www.community.rowancas.org/node/21>) and three (<http://www.rowan.edu/cas/resources/documents/CollegiateDrinking.doc.doc>) in the *When They Drink* series.

drugs and prescription medications. In his chapter of *Edgework*, Thomas Workman of the University of Houston-Downtown presents an informed overview of this phenomenon, tracking its sociological origins and suggesting its role in the decision made by some students to experiment with and use illicit substances.

- In order to better understand these illicit substances and some of the more commonly used prescription medications by contemporary collegians, Brian McMillen of Eastern Carolina University presents an overview of the pharmacology of various of these substances. In his chapter, Dr. McMillen uses a blend of case study and current pharmacological science to present the reader with an easy to understand primer on some of the more commonly used illicit substances by contemporary collegians.
- In order to shed some light on what contemporary colleges and universities are doing to address the issue of student use of illicit substances, Valerie Davis-LaMastro of Rowan University presents an overview of best practices and current thinking as regards prevention efforts intended to address the use of alcohol and other drugs on college campuses.
- In his chapter, *I Said No to Drugs...but the Drugs Wouldn't Listen!*, Michael McNeill of Columbia University presents a thoughtful consideration of the issue of collegiate drug use in order to help the reader glean something of an “insider’s view” of the use of illicit drugs by contemporary collegians.

References

- Dickerson, D. (2007). *Risk Management and the Millennial Generation*. Copies available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1093684 (last visited 16 October 2008).
- Lucey, R. (2006). Substance use on campus: A brief history. In R. Chapman (Ed.) *When they Drink: Practitioner views & lessons learned on preventing high-risk collegiate drinking*, Pp 22 - 36. Available at <http://www.community.rowancas.org/node/21>, 05-09. (Last visited 16 October 2008).
- Marano, H. M. (2004). A Nation of Wimps, *Psychology Today*; Nov/Dec 2004. Available online at <http://psychologytoday.com/articles/pto-20041112-000010.html> (last visited 16 October 2008).
- Sandfort, M. H. & Haworth, J. G. (2002). Available online, <http://www.collegevalues.org/articles.cfm?a=1&id=613> (last visited 16 October 2008).
- Sciarra, D. T., (1999). *Multiculturalism in counseling*. Itasca, Illinois: F. E. Peacock Publishers, Inc.
- Workman, T (2006). *Get to know me*. Available online at <http://www.retain.unl.edu/GetToKnowMeBook.pdf> (last visited 16 October 2008).

About the Author

Robert J. Chapman, PhD, is an experienced student affairs professional, professional counselor, counselor educator, and consultant in the area of alcohol and other drug issues in secondary and higher education. Currently he serves as Clinical Assistant Professor of Behavioral Health Counseling in the College of Nursing & Health Professions, Drexel University, Philadelphia, PA. He has worked in the addictions field since January of 1974, most recently as the Alcohol & Other Drug Program Coordinator at La Salle University in Philadelphia, PA. To learn more visit his LinkedIn profile at <http://www.linkedin.com/in/rjchapman>

To the edge and back again: Edgework and collegiate drug use

Thomas Workman, Ph.D.

University of Houston-Downtown

Submitted for inclusion in the Monograph on College Drug Use
for the Rowan University Center for Addiction Studies

R. Chapman, Editor

To the edge and back again: Edgework and collegiate drug use

Thomas Workman, Ph.D.

University of Houston-Downtown

ABSTRACT

Theoretical attempts to explain substance use and other high-risk behaviors often adopt an “assumption of malevolence” that suggest negative causes for and outcomes from the behavior, particularly in adolescent populations (Hamilton and Collins, 1981). Edgework theory (Lyng, 1990), on the other hand, offers a different perspective, suggesting that a social and cultural structure surrounds high-risk behaviors, giving these behaviors a deeper set of meanings and functions. In this chapter, Edgework Theory is applied to college student substance use. Four aspects of Edgework are explored and implications for college substance prevention are provided. Implications include the potential of edgework research to influence substance use education, counseling, and the environmental management of college communities, along with new approaches to engaging students and groups who demonstrate successful and unsuccessful edgework practices.

A growing criticism of traditional literature on adolescent alcohol and other drug use surrounds what researchers Hamilton and Collins (1981) label an “assumption of malevolence” about the causes and outcomes associated with this form of high-risk behavior (Gusfield, 1996, Hansen, 1995, Leigh & Morrison, 1991; Lupton, 1999). Indicative of this, Tooley (1994) writes:

The government’s perception of illicit drug use is clear: drug use causes social misery. Illicit drugs are dangerous and addictive: they are “unholy.” And what about those who indulge in the use of these unholy substances? They are obviously sick, out of control, and in need of outside intervention to protect them from these dangerous drugs and from themselves.

A 2007 Substance Abuse and Mental Health Services Administration (SAMHSA) publication typifies this perspective:

An adolescent's decision to use drugs or not is the product of many forces, including social acceptability, parental influence, use promotion, substance availability, and drug policies; these mix together to provide the waters in which the adolescent navigates through one of life's most vulnerable stages, a time typified by puberty, the need to "fit in," and stresses at home, school, and in personal relationships.

Sociologists and anthropologists, however, have also studied substance use from an entirely different paradigm. In the sociological perspective, the assumption that substance use is naturally a dysfunctional and problematic behavior is replaced with the hypothesis that substance use may be a meaningful practice that fulfills some sociological, psychological, or cultural purpose for both individuals and groups, if not society itself. In his forward to Richard Rudgley's (1993) cultural history of intoxicants in society, William Emboden writes, "Who we are and where we live has been conditioned by a wide range of intoxicants, and our religious origins and extant ceremonies of importance are also deeply linked to these essential substances" (p. vii).

Unfortunately, scholarship within this paradigm is often misjudged as recklessly supportive of substance use, and therefore is often rejected by public health officials and epidemiologists who are keenly aware of the primary and secondary harms that accompany the practices, whether they hold cultural meaning or not. The absence of these theories in most government-funded publications on substance use makes the perceived value of this alternative perspective abundantly clear.

Yet there is great utility in the sociological and anthropological scholarship on substance use. These theories can aid in the development of prevention and intervention programs and messages that recognize and interact with the connotative *meanings* of behavioral practices. Often, there are explanations for behavior in these theories that uncover new and previously unexplored dimensions of substance use and abuse such as environmental influences or cultural rituals. These can and should be applied to enhance prevention and intervention efforts.

The body of scholarship on Edgework as a sociological theory serves as a critical case-in-point. Initially developed by Stephen Lyng and David Snow (1986) in a five-year ethnography of skydivers and influenced by a term coined by journalist Hunter S. Thompson (whose own life personified the concept), edgework is a theory of "voluntary risk-taking" where the individual

“edgeworker” actively negotiates the boundaries (or edge) of risk by successfully navigating to that edge and back again. Lyng (2006) admits that the study of edgework “diverges significantly from [this] problem orientation,” adding that the empirical research on a broad range of edgework activities found that “individuals are motivated to participate in such risky behavior because they find the experience to be seductively appealing. Those who venture close to the edge are attracted by embodied pleasures of such high intensity that they often have addictive qualities” (p. 18).

Edgework is a practice, engaged through a wide variety of death-defying activities (skydiving, motorcycle racing), high-risk occupations (firefighting, test piloting) and a broader set of experiences such as alcohol and other drug use where the boundaries of “life versus death, consciousness versus unconsciousness, sanity versus insanity, an ordered sense of self and environment versus a disordered self and environment” (Lyng, 1990 p. 857) are negotiated by engaging in the activity to the point where either outcome is possible.

Edgework is conceptually similar to “sensation seeking,” described by Zuckerman (1993) as “the seeking of varied, novel, complex, and intense sensations and experiences and the willingness to take physical, social, legal, and financial risks for the sake of such experience” (p. 27). Research in sensation seeking (Arnett, 1991, 1992, 1995, 1996; Zuckerman, 1983, 1994; Horvath & Zuckerman, 1993) views this phenomenon from a biosocial perspective and assumes the motivation for engaging in the behavior is primarily physiological in nature. For Zuckerman, sensation seeking is a measurable personality trait that peaks in adolescence and diminishes in adulthood (1983, 1994).

Sensation-seeking literature suggests that a range of high-risk behaviors – from substance use to unsafe sexual practices – occur from an interaction of predisposing genetic factors, social grouping, and environment (Arnett, 1992). Like edgework, sensation seeking theory posits that those inclined to engage in sensation seeking tend to associate with other sensation-seekers, creating a social network that both encourages and supports the practice. Research in sensation seeking has attempted to link a wide variety of psychological and environmental factors such as music, media use, anxiety, and aggressiveness to risk behavior (Arnett, 1991, 1995, 1996; Goodson, McCormick, & Evans, 2000; Weisskirch & Murphy, 2004).

Edgework theory departs from the body of research in sensation seeking, however, in two important ways. First, although it does not attempt to deny a physiological aspect to risk-taking

or the possibility that risk-taking may be a genetic trait, edgework research is more focused on the sociology of the behavior, particularly in the formation of “edgework communities.” Essential to this focus is the relationship between successful risk-taking and group membership and status.

Second, research in edgework focuses beyond the physiological “high” achieved by individuals who are engaged in risky practices and examines the accomplishment of the risk behavior itself, positing that the successful negotiation of risk and the avoidance of disaster may be of greater social worth than the actual state of arousal gained through the action.

Studies of edgework have been conducted on a wide range of recreational and occupational activities, but for the purpose of this monograph, focus will be given to behaviors that fall into the realm of “deviance” such as illicit alcohol and other drug use, crime, and violence. A number of studies have explored this aspect of risk-taking (Adler & Adler, 1998; Katz, 1988; Keys & Galliher, 2000; Lupton, 1999; Lyng, 2004; Rajah, 2007; Reith, 2006; Tooley, 1994). Like sensation seeking, the body of literature surrounding edgework doesn’t condone substance use or justifies its use through this new label; it simply recognizes a deeper social and cultural structure that may explain the popularity of these problematic behaviors and provide a broader set of tools in addressing them.

The need for new approaches to prevention and intervention under new perspectives is desperately needed. Despite millions of dollars spent on traditional public health programs to reduce the use and abuse of drugs and alcohol among late adolescents and young adults, the numbers still remain alarmingly high. The Bureau of Justice Statistics reports that in 2005, 25% of all students in grades 9 through 12 reported someone had offered, sold, or given them an illegal drug on school property. There was no measurable change with the percentage of students who reported that drugs were offered, sold, or given to them at school between 2003 and 2005.

The numbers for drug use in college are higher: The National Center on Addiction and Substance Abuse (CASA) at Columbia University (2007) reports that 30% of college students used some form of illicit drugs in 2005. Prescription drug abuse is also a new and growing concern among college students (McCabe et. al., 2005). Excessive alcohol consumption, often labeled “binge” drinking, continues to be an issue for at least 40% of the national college population (Weitzman, et. al., 2004). CASA (2007) also found that 1.8 million full-time college students (22.9 percent)

meet the medical criteria for substance abuse and dependence, two and one half times the 8.5 percent of the general population who meet these same criteria.

Reith (2006) explains that “although the consumption of (illegal) drugs is still regarded as a deviant or marginal form of behavior, ironically, a contrary trend is appearing, the normalization – if not the legalization – of drug use in everyday life,” adding that “Weekend drug-taking is part of the leisure habits of many thousands of young people, who frequently indulge in poly-drug use,” “picking and mixing” ecstasy, cannabis, amphetamines, LSD, and any number of substances to get the best high. The creation, maintenance, and control of this high is a striking instance of the most demanding of edgework” (p. 235).

It is in this spirit of improved intervention and prevention that the theory of edgework is offered. I will first provide an overview of the theory, identifying aspects of particular relevance to substance use, and then explore three implications of the theory on the prevention and intervention practices for young adults engaged in substance use and abuse.

Four aspects of edgework are particularly relevant to substance use among college students. These are *Edgework as Skilled Risk-Taking*, *Edgework as Conspicuous Consumption*, *Edgework as Transcendence*, and *Edgework as Addiction*.

Edgework as Skilled Risk-Taking

Edgework is conceptually separate and distinct from risk aversion or harm reduction; the idea is not to avoid or reduce the risk itself, but to live fully in the moment of risk, “on the edge” of complete catastrophe. Research by Lyng and others (Lyng, 2005; Milovanovic, 2005; Rajah, 2007; Reath, 2005) found that it was the rush created by the level of risk that was itself intoxicating. Reducing the level of potential harm reduces the quality of the edgework experience on both fronts.

Central to the practice of edgework are the skills employed or demonstrated by the edgeworker to successfully engage high-risk activities without facing adverse effects. As Lyng (1990) states, “The threat of death or injury is ever-present in such activities, although participants often claim that only those ‘that don’t know what they’re doing’ are at risk” (p. 857). What often appears as reckless and thoughtless behavior is for edgeworkers a declaration of skill and accomplishment that is only made meaningful when it is tested to its very limit. Thompson himself, in an

interview cited by Lyng (1990) in *Playboy Magazine*, discussed his own drug use as being like “getting on a racing bike and all of a sudden you’re doing 120 miles per hour into a curve that has sand all over it. If you’re good enough, you can pull it out” (p. 858). The reward for accomplishing a high-risk activity without disaster is the acknowledgement that your skills and knowledge are sufficient for the adventure; testing these skills themselves – without being fully sure the test can be passed -- is the actual adventure that fuels the edgework experience. More importantly, each successful demonstration of skill – displayed in surviving the potentially deadly act – provides both status and social capital to the edgeworker with the rest of the community.

A key distinction, however, is needed when discussing the acquisition of these skills. In recreational or occupational edgework, the “knowledge or skills to make a dangerous activity safe enough to undertake” (Rajah, 2007, p. 205) are provided in formal training that is enhanced by personal experience. Test pilots, for example, still face the potential for a high-risk maneuver to end in utter catastrophe, but they also have a set of carefully developed and objective safety guidelines that can be applied to each and every maneuver. No such parallel exists for the edgework of substance use, especially for illicit drugs. The majority of school drug education programs focus on a “no use” message, and those that attempt to teach harm reduction strategies often face criticism from federal agencies (see, for example, NCES 97-279).

Because of this, knowledge and skill are gained only through the edgework community itself – a collection of highly skilled risk-takers who offer models of successful edgework. Skills are inferred through shared narratives within the community as more experienced – and more popular – edgeworkers share their experiences and accomplishments. This alone explains the plethora of substance use stories that circulate in the college culture within high-risk drinking groups (Workman, 2001a, 2005). Much of young adult experience is chronicled in on-line chat rooms, Facebook pages, and assorted web logs and web sites, and circulated as stories that are told in a variety of settings, often as part of the use ritual itself. These stories often focus dangerous use as heroic and side-effects as humorous, even as a lesson in substance use was learned “the hard way” (Workman, 2001b). Narratives of high-risk use serve as learning tools for new substance users in the acquisition of skill and the cultural values of the activity (Workman, 2005).

Even without these personal narratives, young adults are often trained by the narratives of substance use in popular culture. Here, too, the stories often paint risk as pleasurable and desirable, and harm as minimal and humorous. The result has become a normalization of drug use in popular culture where stories of use and even abuse are woven into the characters of

situation comedies who become role models for skilled drug use (Carter, 2007). Similar models can be seen in popular film and music. Poster-sized pictures of John Belushi's character in *Animal House* continues to grace the walls of many college residence hall rooms, despite the fact that Belushi himself, a skilled substance user, died from his excesses.

Tragedy, then, is read to edgeworkers as a sign of poor skills – a youth version of the popular “Darwin Awards” where stupidity is considered the ultimate culprit for death, injury, legal penalties or academic failures. “Smarter” substance abusers remain highly functional and productive. Addiction is also considered a failure, an indication that the recreational substance user was not skilled enough to keep from developing physical dependency. In her study of edgework and substance use, Gerda Reith (2005) writes: “Recreational users are experts at negotiating risk. These are individuals for whom consumption is not out of control; these are “day trippers” who will be back at work or back in college class again by Monday morning.” Research by Shewan, Delgarno, and Reith (2000) found that drug users meticulously planned their desired experiences, balancing the level of thrill (or, as they describe, the avoidance of “boredom”) with the demands of their everyday existence.

Edgework as Conspicuous Consumption

A further distinction between edgework and sensation seeking lies in its theoretical foundations. Much of edgework theory operates from a structivist paradigm; this form of cultural theory -- informed by the works of Marx, Weber, and Baudrillard -- assumes that socio-economic structures have a direct impact on cultural practices and meanings (Milovanovik, 2005). Baudrillard (1998) considered the United States (and all of Western) culture as having moved from an economic base of production to one of consumption, labeling us a “consumer culture.” In this culture, commodities – the ideas and products that are bought and sold – become objects that, instead of meeting a need, incite a desire. Consumption, then, becomes a never-ending quest for satisfaction of that desire, which requires new levels of stimulation with each experience. This process is often referred to as *hyperconsumption*, and it creates an odd paradox for edgework.

The relationship to these (admittedly dense) cultural theories to edgework is two-fold: they explain why, on the one hand, edgework is itself a commodity that is commonly sold in a variety of ways, and why, on the other hand, edgework is often used to commodify other products and services.

Lyng (2006) explains:

Risk behaviors related to sexuality, substance use, motor vehicle operations, crime, and interpersonal conflict and violence have been particularly prominent in the subcultural patterns of postwar youth populations. These patterns became especially influential as the baby boom cohort moved into adolescence and adulthood and its consumption power began to have a powerful effect on the consumer market. The emergence of large numbers of young consumers with money to spend inspired marketing strategies that appealed to the particular consumer tastes of the youth market (p. 8).

Although Strauss and Howe (2006) suggest that the latest generation, labeled Millennials, is less receptive to popular cultural influences surrounding excess and risk, the rapid growth of the “skater culture” (Mortimer, 2008) and the “emo culture” (Kelley & Simon) for this population suggests otherwise. Late adolescents are surrounded by images as both markers of their generation as well as indicators of wealth and prosperity – the wild skaters who make millions of dollars in product endorsements and expositions make up the cast of MTV’s *Jackass* with abundant time and resources to engage in high-risk stunts, the partying twenty-somethings that compete for large cash prizes by enduring extreme conditions or tense living situations for several months, and the college students whose drunken sexual exploits become the content of MTV’s *Spring Break* and the ongoing video series *Girls Gone Wild*.

It is striking, then, to note that rather than identifying edgework as a negative response to difficult life situations – poverty, hopelessness, and stress – research indicates that edgework – particularly the edgework associated with drug use -- is a form of conspicuous consumption for young adults who have higher levels of disposable income than any other previous American generation.

Advertising has long utilized edgework as part of a product’s allure, particularly to late adolescents. Whether selling Mountain Dew or Hummer automobiles or Columbia Winter wear, edgework becomes the central association for the product. Reith (2005) notes that risk-taking is “frequently utilized in commercial advertising and portrayed in the media as a heroic act, with images of courageous individuals engaging in dangerous activities used to promote products that offer consumers excitement and escape” (p. 233).

Edgework as Transcendent

Paradoxically, edgework may also serve as an escape from the consumerism of society and the rigid social system that surrounds it. While sensation seeking assumes that a set of social cues and networks may enable a genetic predisposition for the thrill of risk-taking, edgework theory suggests that risk-taking may be a way for individuals and groups to transcend the social and cultural constraints associated with consumerism. This notion has been extensively developed by Lyng and his colleagues and serves as a key perspective of the theory. Lyng (2005) describes edgework as “a means of freeing oneself from social conditions that deaden or deform the human spirit through overwhelming social regulation and control” (p. 9). In this way, the activity of edgework becomes a way to rise above the social demands, controls and regulations that attempt to keep individuals safe and free from harm but which dampens and destroys an aspect of the human spirit. “In late modernity, our personalities, our subjectivities, our relationships with others, while considered ‘private’ by most people, are intensely governed, such that even aspects of the self deemed intimate and individual such as thoughts and feelings are socially organized” (Lupton, 1995, p.11).

This is especially relevant for residential college students, particularly in their first year on campus. A broad host of special programs, educational sessions, living communities, and student services – all part of the package sold to the young consumer as the college experience -- surround the new student in a grand effort to keep him or her from harm's way. Student codes of conduct often include language referring to “potential of harm to self or others,” enabling judicial administrators to regulate a wide range of private recreational activities. It is not surprising, then, to see substance use continue, often deeply hidden, under these circumstances. Engaging in an activity with a high-level of risk, despite (or perhaps because of) the warnings of the institution, enables the edgeworker to regain some sense of control by “transgressing” a set boundary. The thrill comes in the testing and debunking of the ideology that lives beneath the social contract. Under the public health paradigm, “behavior that could threaten personal safety was regarded as the height of irresponsibility; anyone who could voluntarily take risks was not fulfilling their part of the social contract and, by definition, was engaging in excessive and therefore deviant and abnormal behavior” (Reith, 2005, p. 230). Much like the notion of “forbidden fruit,” increased regulation of risk activities may actually fuel the benefits of edgework by enabling new opportunities to transcend these boundaries.

Another important aspect of transcendence surrounds identity and status. Lyng (1990) suggests that edgework provides feelings of empowerment and even omnipotence. Reith (2005) adds that “the zone of drug use is one of self-actualization and ego work in which users frequently report feeling invincible, exhilarated, and possessed of supernatural human strength and ability” (p.

237). This may be particularly appealing to a new student who now competes for identity confirmation in a new social group, and might explain (along with the fact that many of these younger students have underdeveloped risk-taking skills) why so many of the substance abuse tragedies occur with students in their first or second year of college. Status and identity are easily seen in the online stories and social network personas of college students who engage in high-risk activities. Fraternity members often described the excessive drinking of their brothers as “legendary” (Workman, 2001b); intoxicating substances are commonly known as “social lubricants” that allow individuals to engage in a set of behaviors they might otherwise have kept constrained. Edgework and the circulation of its narratives across the college culture provides the opportunity for a new student to gain notoriety, identity, and self-worth.

Edgework as Addictive

Like populations studied under sensation seeking, many of the edgeworkers expressed that the experience of edgework was “an addictive, euphoric adrenalin rush” that could only be experienced in the instance of the edgework itself (Ferrell, 2005). There is in many ways a striking similarity between the addiction to sensation seeking/edgework and the *physical* addiction to substance use in that both seek a pleasant physical sensation as well as an escape from reality, and both require increased amounts of dosage to recreate the original “high.” But much of the literature on the addictive nature of edgework suggests a psychological dependency that is equally relevant to substance use.

As mentioned earlier, edgework’s “thrill” comes from its self-realization, ego satisfaction, and transcendence from social constraint. This is particularly true of edgework surrounding illicit activities such as crime, violence, and substance use. Unlike risky but legal activity such as motorcycling and skydiving, illicit edgeworkers find the potential for getting caught or facing criminal penalties adds to the euphoria of the experience, suggesting that risk of legal harm can constitute as much of the “edge” as the possibility of physical harm. Ferrell (2005), who studied anarchist graffiti artists by living and engaging in edgework with them, expresses his own experience:

The rush of being out on a nocturnal adventure with other writers, of seeing our art take shape on an alley wall, was one thing, but the rush of doing this when the local media was labeling us as the city’s worst crime threat, when the mayor was seriously pissed off by the local “graffiti problem,” when the police were sweeping by with spotlights and special patrols – now that was something else (p. 83).

It is interesting to note the ways in which college students engage in illicit activities, especially in environments that have increased controls. Every aspect of the illicit substance experience – the acquisition of the substance, the maneuvering of the actual event to avoid surveillance, the careful control of behaviors while intoxicated so that they don't draw attention from enforcement, the careful covering of evidence after the event, all add to the psychological excitement of the activity. It was common to hear college students describe their substance use experiences as less compelling when they arrived at a college environment that had little control; the thrill of “sneaking” the substance was lost, the activity became commonplace, and the motive for drinking was diminished (Workman, 2001b).

Addiction, however, is the ultimate failure of edgework, as it changes the nature of risk-taking from voluntary to forced engagement, from control to chaos, and from self-actualization to self-destruction. In an edgework community (defined as a group that shares an edgework activity such as drug use or motorcycle racing), those who are unable to maintain control are often reviled or vilified (Collisan, 1996). Likewise, in college culture, a notorious party animal loses his or her hero status when he or she starts to show signs of dependency, or even poor choices while intoxicated that end in injury or serious legal consequences. When edgework is performed outside of the control of the individual, it is no longer edgework, and it is rejected by edgeworker peers. Interestingly enough, this social rejection often serves to motivate an addict to seek treatment.

Applying the Edgework Model to College Alcohol and Other Drug Use: Implications

The theory of edgework offers an alternate set of explanations for the substance use behavior occurring among college students. The theory clarifies a set of behaviors that have often been vaguely (and perhaps incorrectly) labeled as a “rite of passage” (Butler, 1990). In fact, adulthood (as a social construct) does not seem to have significant bearing on the edgework experience other than in the acquisition of skills, which may also explain why age of use/activity laws are often challenged in college environments; edgework has no minimum age requirement.

More importantly, edgework theory suggests a critical link between risk behavior and social capital that explains the allure of risk-behaviors like illicit alcohol and other drug use, particularly among incoming first-year students. Where sensation seeking theory suggests that only those pre-disposed to seek the sensations of risk are influenced by risk-taking groups, edgework theory explains how new entrants in a social structure might view social groups that

are marked by edgework activities (identified by self-report data as athletes, fraternity and sorority members, and others) as having high social status or strong social cohesion and the edgework activity as the way in which new members gain social capital with the group. Those lacking the skills to succeed in the edgework activity not only fail to gain the social capital needed to become a member of the group, they most likely account for many of the 816,696 drug-related emergency department visits in 2005 which involved a major substance of abuse (DAWN, 2007).

If accurate, edgework theory and research offers a significant potential contribution to the prevention and intervention activities occurring on most college campuses. Central to each of these implications is the realization that successful edgework comes in a wide variety of forms and formats, each yielding a similar thrill and offering social capital to those who succeed in accomplishing them. In fact, edgework might be divided into two primary categories: productive and destructive. Some edgework practices, while carrying a risk for catastrophe, yield positive results when successfully completed, such as firefighting, police work, and parachuting. Other edgework practices focus on destructive behaviors that even when successfully accomplished yield little benefit to the group or the individual. Given the nature of psychotropic substances – their addictive qualities and their nature wear on the physical health of the user -- long term, high-risk use seems ultimately destructive. The question emerges whether these destructive forms of edgework can be replaced by college students with other, more productive risk practices that enable the cultural benefits without ultimate harm.

Four aspects of this implication will be examined as potential approaches to intervention and prevention of multiple substance use: Failure, Skills Acquisition, and Intervention.

Edgework explains the circulation of high-risk substance use as a practice that holds value, if not utility, for the college culture, because it provides the perfect alternative explanation for the tragedies that surround substance use. Rather than assuming that the use of the substance itself is to blame for chaos and harm, edgework refocuses the blame for tragedy on the poor skills of the user. Under this conceptualization of substance use, there is no need to control the substance, but to train the substance user to take more skilled adventures. The accuracy of this perspective has yet to be seen – no studies have looked at successful substance use among any population to support the idea that a well-planned and executed intoxication experience can be accomplished without harm, despite the fact that there are, based on estimates provided by the National Institute of Alcohol Abuse and Alcoholism (NIAAA), clearly thousands of intoxication experiences by college students that end successfully for every one that ends in death or tragedy. Though this is an unpopular reality among those in the prevention and intervention community, it

is a well documented and circulated argument among students living in the culture (Workman, 2001a).

This reality may, however, provide additional support for the growing number of colleges and universities that offer harm reduction education, including elaborate efforts to teach students about accomplishing a level of pleasant intoxication (often called a “buzz”) without stepping over the line into acute intoxication where more harmful effects can occur. The controversy surrounding illicit use of all substances, however, must be fully addressed for this to occur. One approach is to incorporate legal harm into the equation of risk assessment for students, particularly in places where control and enforcement efforts have increased the potential for legal citation for underage use or use of a controlled substance. This delicate balance between control of substances and harm reduction education must be carefully navigated by communities addressing substance use among students, and requires open communication and dialogue across all stakeholders.

Individual failure to engage in a high-risk activity without legal, physical, personal or academic harm, however, has proven to be a significant motivator for individual and group intervention. Recognizing where and how students fail to engage successful edgework is a critical opportunity for practitioners that should be further explored, as it may be a key factor in the motivation to change behavior. The transtheoretical model, often called “Stages of Change” theory posits that readiness to change behavior occurs in the progression of key stages from pre-contemplation to maintenance (Prochaska & DiClemente, 1982). This approach is commonly used in substance abuse intervention and treatment. Failure at edgework – and the social rejection it creates by the remaining edgework community – can serve as the shift from pre-contemplation to contemplation. Studies of motivational interviewing, a strategy that incorporates the transtheoretical model, have shown success in reducing substance use among college students (Marlatt, 1989; Miller, 1983). Many universities offer motivational interviewing as a first response to adjudicated students who have violated campus substance policies, and edgework theory would support this approach, but with a different emphasis within the interview itself.

As is common in motivational interviews, one of the tasks of the counselor is to develop the internal dissonance of the client between their perceived goals and their high-risk behavior. Applying the edgework concept might suggest that the counselor offer a history of harm, including the judicial sanction leading to the interview, as evidence of an inability to live a high-risk lifestyle, at least through substance use. The counselor may also begin to explore, in the later stages of preparation and change, the development of skills or knowledge surrounding other (and legal) forms of edgework that can meet the client’s need for boundary testing in more

successful arenas. Key to this approach is the realization of success and failure rather than the condemnation of the activity or the movement from a life “on the edge” to a life of safety. If edgework theory is indeed accurate, then attempting to change a student’s desire to engage in high-risk activity should not be the target of the intervention. A better target, under this theory, would be to move the student from one set of destructive edgework practices that live outside the realm of the student’s ability (this producing failure and rejection) to another set of productive edgework practices that have better forms of training and skill acquisition, producing a sense of success and self-actualization to support the maintenance of the change.

Framing intervention around the concept of edgework also provides a different conversation about physiological tolerance to substances. An experienced edgeworker experiencing physical tolerance to a substance may have difficulty successfully reaching the edge in much the same way that an elderly race driver no longer has the physical stamina to endure the strain of fast speed maneuvering. Interventions with experienced edgeworkers who demonstrate signs of substance tolerance may benefit from a discussion of the impact of tolerance on the successful negotiation of risk.

Edgework failure may also help change the way in which campuses address high-risk groups. Like individuals, edgework communities may seek a change in its practices when failure to successfully negotiate the edge is realized. Groups identifying themselves as successful at engaging illicit behavior (particularly while also maintaining high group grades or active campus involvement) may need other indicators of failure to come to this realization. One approach is to identify the number of individual failures that exist within the group, particularly among those members who hold the highest level of status in the group for their edgework activities. Farr and Miller’s (2003) Small Group Norms Intervention, as part of a broader program to change the high-risk culture within fraternities and sororities, has been successfully applied at the University of Nebraska-Lincoln, not for its role in addressing misperceptions of group member use, but in its role as identifying group members whose substance use has become unsuccessful at achieving a high-risk experience without harm or dependency. The result has been a significant increase in fraternities and sororities seeking intervention and treatment for members it originally deemed as edgework heroes, and a reduction in high use rates across the population.

Another approach through the same project enabled fraternities and sororities to identify the areas where the organization as a whole was failing, either through insufficient member recruitment or retention, poor relations with university administrators and/or the general public, unpleasant living conditions, or poor morale. In conversations with group leaders and members, these “failures” of the group were explored independent of the group’s illicit activities, yet in

several cases, the connection to these activities was undeniable, and leaders began to understand the group's failure at successfully engaging high-risk activities without realizing adverse effects on the organization. When such realizations occurred, leadership mentors could assist the group with finding replacement activities that offered better outcomes for the group.

Intervening in Social Capital Acquisition and Hazing

As argued earlier, new members may see the practices of any edgework community as attractive sources of social capital. Under this assumption, there may be value in considering high-risk groups such as athletes, fraternity and sorority members, or any other cultural group on campus that share similar patterns of substance use as edgework communities, examining how these groups select and reject members based on their skills at surviving high-risk substance use experiences. Both formal and informal membership rituals, considered under this paradigm, offer new insights to the issue of hazing via substance abuse and why the practice still exists despite the abundance of policies prohibiting it and efforts to curb it.

Under the edgework paradigm, hazing may be part of an elaborate group function where potential members are tested in their level of skill and commitment to edgework practices. Fraternity and athletic team initiations that involve high amounts of forced alcohol consumption offer new members a chance to demonstrate their skills in participating in edgework practices. Perhaps this is why such rituals involve such severe levels of intoxication; once the new member proves his or her ability to successfully negotiate the high level of risk, the group is assured that they will succeed in all similar consumption activities. This also explains the willingness of the new member to participate in the hazing ritual; it is the student's one chance to prove his or her worthiness for inclusion in the group.

Prohibition of hazing activities, then, does little to replace the deeper cultural need for meaningful entry into a group or organization. Edgework theory would suggest that the cultural practice needs to be reshaped so that membership is earned through other facets of the group's identity, requiring extensive mentoring by alumni and leaders who are willing to develop social capital around other behaviors that incorporate more controlled risk. Again, assisting a group in replacing destructive edgework entrance requirements with more productive edgework practices may yield more results than banning all initiation rituals outright.

Creating and Changing Edgework Environments

Implicit in this suggestion, however, is the role for the larger campus-community to assess and provide places where productive edgework practices can occur. A popular approach to addressing substance use on campus is environmental management, where coalitions from the campus and community seek to address environmental influences that enable or promote high-risk use (DeJong et. al, 1998). Much of environmental management's early writings focused on enhancing control and eliminating aspects of the environment that increased the access and availability of the substances used in high-risk practices. Unsurprisingly, these efforts were greeted with great resistance in many campus-communities, and the empirical evidence of this approach as a successful strategy has been minimized (Weitzman, et. al., 2004).

Edgework theory would suggest that this resistance is more related to the environment's failure to provide alternative opportunities for risk-taking than to the desire to maintain open access to alcohol and other drugs. Aspects of environmental management refocusing on replacing positive risk-taking opportunities, such as ropes courses, rock climbing expeditions, and other extreme sports events, while removing negative risk-taking opportunities through controlled substances, may yield greater success. Moreover, providing students with the skill acquisition to engage these positive forms of edgework is critical, and adjusting the sources for knowledge and skill surrounding high-risk substance use, particularly those in popular culture, may be warranted. The growth of recreational programs and the addition of high-risk recreational activities on college campuses serve as a case in point. Although these are a limited substitute considering the diverse interests and needs of the student population, they are a step in the right direction for some of the population.

Edgework and Social Control

One last aspect of edgework that has utility in addressing college substance use surrounds the role of social control. As seen in the literature, the heightened regulation and control of the college experience may actually fuel the desire for and satisfaction from edgework activity. Several aspects of control need examination.

The first aspect relates to environmental management, and the proclivity for colleges and universities to engage in "war" rhetoric surrounding substance use. This is, of course, an offshoot of the national "war on drugs" that has also faced similar controversy and resistance. In practice, the employment of a war metaphor places the substance user rather than the substance as the enemy, part of the problem rather than part of the solution (Workman, 2001a). Criminalizing an activity seems to have an increased effect on the pleasure derived from edgework, establishing a cat and mouse game of "catch me if you can." Unless campus-

communities are committed to long-term, vigilant enforcement, criminal activity is likely to flourish.

Policy and enforcement, however, does have a vital role in driving edgework back to more socially acceptable forms, and vigilance may be the best course to eliminate the opportunities for engaging in illicit edgework while increasing the choices for more acceptable forms of risk-taking. The lesson from the edgework literature, however, is clear that half-hearted or misdirected policy enforcement efforts only increase the drive and opportunity for ongoing risk-taking.

A greater concern and issue surrounds the regulation and social control of the college experience itself. As an institution, colleges and universities – especially large state-funded institutions -- are notorious for their depersonalization of the individual, for endless bureaucracy, constant surveillance, and excessive structure. All of these factors, according to the studies of edgework, only add to the constraint felt by individuals and the desire for boundary transgression, a root aspect of edgework. Millennials, especially, have been subjected to extreme forms of control and structure, raised under a set of social and parental controls that have been blamed for both the entitlement as well as the stress that marks the generation (Coombs and DeBard, 2004). Edgework theory would suggest that the common response for at least part of the population is to regain a sense of autonomy and liberation from these social constraints through voluntary risk-taking. Both institutions of secondary and higher education must look carefully at ways in which this generation responds to this structure through edgework, and develop new ways of structuring the college experience that enhances autonomy.

Edgework offers a wide variety of new insights and approaches to substance use prevention and intervention, but much more research is needed within the substance abuse community to better understand the edgework surrounding high-risk alcohol and other drug use among college students, and the efficacy of programs that address edgework motivations and environments. Engaging in this research may provide a missing link in existing efforts, increasing the success of college prevention and intervention multifold.

References

- Arnett, J. J. (1991). Heavy metal music and reckless behavior among adolescents. *Journal of Youth and Adolescence*, 20, 573-592.
- Arnett, J. J. (1992). Socialization and adolescent reckless behavior: A reply to Jessor. *Developmental Review*, 12, 391-409.
- Arnett, J. J. (1995). Adolescents' use of media for self-socialization. *Journal of Youth and Adolescence*, 24, 519-533.
- Arnett, J. J. (1996). Sensation seeking, aggressiveness, and adolescent reckless behavior. *Personality and Individual Differences*, 20, 693-702.
- Baudrillard, J. (1998). *The consumer society: Myths and structures*. London: Sage.
- Bureau of Justice Statistics and The U.S. Department of Education. (2006, December) *Indicators of School Crime and Safety, 2006*, NCJ 214262.
- Butler, E.R. (1990, April). Alcohol use by adolescents and young adults: A rite of passage into adulthood. Paper presented at the Kansas Association for Counseling and Development, Topeka, Kansas. ED 324 628.
- Carter, P. (2007). Drug dealers as folk heroes? Drugs and television situation comedy. In P. Manning (Ed.) *Drugs and popular culture: Drugs, media and identity in contemporary society*. Cullumpton, Devon (UK): Willan.
- Collisan, M. (1996). In search of the high life: Drugs, crime, masculinity and consumption. *British Journal of Criminology*, 36 (3): 428-444.
- Coomes, M., and DeBard, R. (2004). Serving the Millennial Generation. *New Directions for Student Services*, 106, 33

- DeJong, W., Vince-Whitman, C., Colthurst, T., Cretalle, M., Gilbreath, M. Rosati, M., and Zweig, K. (1998). *Environmental management: A comprehensive strategy for reducing alcohol and other drug use on college campuses*. Newton, MA: Higher Education Center for Alcohol and Other Drug Prevention.
- Emboden, W. (1993). Forward. In R. Rudgley, *Essential substances: A cultural history of intoxicants in society*. New York: Kodansha International.
- Far, J & Miller, J (2003). The Small Group Norms Challenging Model: Social Norms Interventions with Targeted High Risk Groups. In H.W. Perkins (Ed). *The Social Norms Approach to Preventing School and College Age Substance Abuse: A Handbook for Educators, Counselors, Clinicians*. San Francisco, Jossey-Bass.
- Ferrell, J. (2005). The only possible adventure: Edgework and anarchy. In S. Lyng (Ed.) *Edgework: The sociology of risk taking*, pp 75-88. New York: Routledge.
- Goodson, P., McCormick, D., & Evans, A. (2000). Sex on the Internet: College students' emotional arousal when viewing sexually explicit materials online. *Journal of Sex Education and Therapy*, 25, 252-260.
- Gusfield, J. (1996). *Contested meanings: The construction of alcohol problems*. Madison, WI: University of Wisconsin Press.
- Hamilton, C.J., and Collins, J.J. (1981). The role of alcohol in wife beating and abuse: a review of the literature, in *Drinking and Crime: Perspectives on the Relationships between Alcohol Consumption and Criminal Behavior* (J.J. Collins, Ed.), pp 253–287. Guilford Press, New York.
- Hanson, D.J. (2005). *Preventing alcohol abuse: Alcohol, culture, and control*. Westport, CT: Praeger.

Horvath, P., & Zuckerman, M. (1993). Sensation seeking, risk appraisal, and risky behavior. *Personality and Individual Differences, 14*, 41-52.

Johnston, L.D., O'Malley P.M., Bachman J.G., Schulenberg, J.E. (2005). *Monitoring the future national results on adolescent drug use: Overview of key findings, 2004*. National Institute on Drug Abuse. (NIH Publication No. 05-5726).

Kelley, L. and Simon, T. (2007). Everybody hurts: An essential guide to emo culture. New York, NY: HarperCollins.

Kidder, J.L. (2006). "It's the job that I love": Bike messengers and edgework. *Sociological Forum, 21*(1), 31-54.

LaBrie, J.W., Thompson, A.D., Huchting, K., Lac, A., and Buckley, K. (2007).

A group Motivational Interviewing intervention reduces drinking and alcohol-related negative consequences in adjudicated college women. *Addictive Behaviors, 32*(7), Pages 2549-2562

Laurendeau, J. (2006). "He didn't go in doing a skydive": Sustaining the illusion of control in an edgework activity. *Sociological Perspectives, 49* (4), 583-605.

Lupton, D. (1999). *Risk*. London: Routledge.

Lupton, D. (1995). *The imperative of health: Public health and the regulated body*. London (UK): Sage.

Lyng, S.G. and Snow, D.A. (1986). Vocabularies of motive and high-risk behavior: The case of skydiving. In E.J. Lawler (Ed.), *Advances in group processes, Volume 3*. pp. 157 – 179. Greenwich, CT: JAI.

Lyng, S. (2005a). Edgework and the risk-taking experience. In S. Lyng (Ed.) *Edgework: The sociology of risk taking*, New York: Routledge, 3 – 16.

Lyng, S. (2005b). Sociology at the edge: Social theory and voluntary risk taking. In S. Lyng (Ed.) *Edgework: The sociology of risk taking*, New York: Routledge, 17-50.

Lyng, S. (2004). Crime, edgework, and corporeal transaction. *Theoretical Criminology*, 8 (3), 359-375.

Lyng, S. (1990). Edgework: A social psychological analysis of voluntary risktaking. *American Journal of Sociology*, 95(4), 851-886.

Marlatt, G.A., Baer, J.S., Kivlahan, D.R., Dimeff, L.A., Larimer, M.E., Quigley, L.A., Somers, J.M., & Williams, E. (1998). Screening and Brief Intervention for High-Risk College Student Drinkers: Results From a 2-Year Follow-Up Assessment. *Journal Consult Clinical Psychology*, 66, 604 615.

McCabe, S. E.; Teter, C. J.; Boyd, C. J.; Knight, J. R.; and Wechsler, H.(2005). “Nonmedical Use of Prescription Opioids among U.S. College Students: Prevalence and Correlates from a National Survey. *Addictive Behaviors* 30: 789–805.

Miller, E.M. (1991). Assessing the risk of inattention to class, race. Ethnicity, and gender: Comment on Lyng. *American Journal of Sociology*, 96 (6), 1530-1534.

Miller, W.R. (1983). Motivational Interview With Problem Drinkers. *Behavioral Psychotherapy* 11, 147-172.

- Milovanovic, D. (2005). Edgework: A subjective and structural model for negotiating boundaries. In S. Lyng (Ed.) *Edgework: The sociology of risk taking*, New York: Routledge, 51-74.
- Mortimer, S. (2008). *Stalefish: skateboard culture from the rejects who made it*. San Francisco, CA: Chronicle Books.
- National Center on Addiction and Substance Abuse at Columbia University. (2007). *Wasting the Best and the Brightest: Substance Abuse at America's Colleges and Universities*. Available at <http://www.casacolumbia.org/ViewProduct.aspx?PRODUCTID={D6B8EBB3-7378-4de8-A4F1-39C7C4B401E4}> (Last visited 16 October 2008)
- National Center on Addiction and Substance Abuse at Columbia University. (2005). *National survey of American attitudes on substance abuse X: teens and parents*. Available at <http://www.casacolumbia.org/ViewProduct.aspx?PRODUCTID={04611491-B593-4e77-BEAF-0DDECC50F86A}> (last visited 16 October 2008)
- Prochaska, J. O. and C. C. DiClemente (1982). Transtheoretical therapy: Toward a more integrative model of change. *Psychotherapy: Theory, Research and Practice*, 19(3): 276-288.
- Rajah, V. (2007). Resistance as edgework in violent intimate relationships of drug-involved women. *British Journal of Criminology*, 47, 196-213.
- Reith, G. (2005). On the edge: Drugs and consumption of risk in late modernity. In S. Lyng (Ed.) *Edgework: The sociology of risk taking*, New York: Routledge, 227-246.
- Shewan, D., Delgarno, P., and Reith, G. (2000). Perceived risk and risk reduction among ecstasy users: The role of drug, set and setting. *The International Journal of Drug Policy*, 10, 431-453.

Scheper-Hughes, N., and Lock, M.L. The Mindful Body: A Prolegomenon to Future Work in Medical Anthropology. In P.J. Brown (Ed). *Understanding and Applying Medical Anthropology*. Mountain View, California: Mayfield, 1998.

Strauss, W. and Howe, N. (2006). *Millennials and the pop culture: Strategies for a new generation of consumers*. Life Course Associates.

Substance Abuse and Mental Health Services Administration, Office of Applied Studies. (October 18, 2007). *The OAS Report: A Day in the Life of American Adolescents: Substance Use Facts*. Rockville, MD.

Tooley, J. (1994). Demon drugs and holy wars: Canadian drug policy as symbolic action.

Masters Thesis, Carleton University, Toronto. Accessed June 21, 2008 at <http://www.cfdp.ca/thesis.htm>

U. S. Department of Health and Human Services, SAMHSA, Office of Applied Studies. (2007). *Drug Abuse Warning Network, 2005: National Estimates of Drug-Related Emergency Department Visits*. DAWN Series D-29, DHHS Publication No. (SMA) 07-4256, Rockville, MD.

U.S. Department of Education, Office of Educational Research and Improvement. (1997, June). *Student Reports of Availability, Peer Approval, and Use of Alcohol, Marijuana, and Other Drugs at School: 1993*. Statistics in Brief . NCES 97-279.

Weisskirch, R.S., and Murphy, L.C. (2004). Friends, porn, and punk: sensation seeking in personal relationships, Internet activities, and music preference among college students. *Adolescence*, 39 (154), 189-201.

Weitzman E.R., Nelson T.F., Lee H., and Wechsler, H. (2004) Reducing drinking and related harms in college: Evaluation of the "A Matter of Degree" program. *American Journal of Preventive Medicine*, 27(3).

- Workman, T.A. (2005). Drinking stories as learning tools: Socially situated experiential learning and popular culture. In L. Lederman and L.P. Stewart (Eds.), *Changing the culture of college drinking: A socially situated health communication campaign*. Cresskill, NJ: Hampton Press
- Workman, T.A. (2001a). An intertextual analysis of the college alcohol culture. Dissertation, University of Nebraska-Lincoln.
- Workman, T.A. (2001b). Finding the meanings of college drinking: An analysis of fraternity drinking stories. *Health Communication*, 13 (2), 427-448.
- Zuckerman, M. (1983). A biological theory of sensation-seeking. In M. Zuckerman (Ed.), *Biological bases of sensation-seeking, impulsivity, and anxiety*. Hillsdale, NJ: Lawrence Erlbaum.
- Zuckerman, M. (1994). *Behavioral expression and biosocial bases of sensation seeking*. New York: Cambridge University Press.
- Zuckerman, M., & Kuhlman, M. (2000). Personality and risk-taking: Common biosocial factors. *Journal of Personality*, 68, 999-1029.

About the Author

Thomas Workman, Ph.D., is an Assistant Professor of Communication Studies at the University of Houston-Downtown. He is currently working as a Section Leader for the Eisenberg Center for Decision and Communication Sciences, a multi-disciplinary team funded by the Agency for Health Quality Research and housed at the Baylor College of Medicine. Tom serves on the Review Board for the U.S. Department of Education's Higher Education Center for Alcohol, Other Drug, and Violence Prevention and the Center for Excellence in Higher Education Law and Policy at Stetson University. Tom is the National Chair for the Alcohol and Other Drug Knowledge Community for the National Association for Student Personnel Administrators (NASPA), and serves on the Editorial Board for *Health Communication* and *Communication Quarterly*. Visit Dr. Workman's LinkedIn Profile at <http://www.linkedin.com/in/thomasworkman>

After Alcohol, Those Other Drugs that Your Students Use

Brian A. McMillen, Ph.D.

Eastern Carolina University

“I don’t know why, but adolescent males like to hallucinate.”

W. J. Meggs, M.D.

As an emergency medicine physician at a large hospital in a university town, Bill Meggs has seen the consequences from most of what college students will swallow, snort, inhale, and sometimes inject. Alcohol, tobacco, and marijuana remain the “big three” of abused substances, but an ever changing potpourri of other drugs are being consumed as well. The *Youth Risk Behavior Surveillance* data for high school students grades 9 – 12 in 1997 showed that current alcohol, tobacco, and marijuana use were 50.8%, 16.7%, and 26.2% (Kann et al., 1998). Current cocaine use was 3.3%. The data for 2005 were 43.3%, 23% and 20.2% and cocaine use was 3.4% (Eaton et al., 2006). In both surveys, 2.1% of respondents stated that they had injected drugs. In addition, the 2005 survey indicated that lifetime use of inhalants was 12.4% and rates for hallucinogens and amphetamines were 8.5% and 6.2%, respectively; those students are in your college today. Data for 2005 available from the Core Institute web site (http://www.siu.edu/departments/coreinst/public_html/) show little change over the last decade in college student consumption of alcohol, marijuana or cocaine with 30-day prevalence rates of 72.8%, 16.7% and 2.1%, respectively.

During February of 2002, this and nine other institutions of higher learning in North Carolina jointly used the online Student Health Survey from OutsidetheClassroom. The first question for the students is, “which of the following are a problem on your campus?” Respondents are then asked to rate 25 items from “no problem” to a “very great problem.” The combined percentages for great and very great problems yields “Stress” as the number one problem (60.3% of 3,753 respondents), tobacco was second, alcohol third (39.2%), marijuana was sixth and other drugs was (18.9%). However, 9.8% reported having used ecstasy (methylenedioxymethamphetamine or MDMA) and another 9.8% reported having used cocaine or crack one or more times in the last year compared to 36.7% for marijuana. These data pose an interesting question; were the respondents stressed due to lost study time while drinking and using drugs or were they drinking and using drugs to relieve stress?

Before proceeding, it is necessary to throw in a caveat about the above and all other self-report data that get used in scholarly papers and government reports addressing the substance use habits of adolescents and young adults. Rule number one of self-report survey data and interviews is that “they (respondents) lie.” Rule number two is that the greater the negative social or legal consequences associated with a behavior the more likely it is that they (respondents) will lie and deny. One should view numbers from these surveys for drugs such as cocaine and narcotics as serious *underestimates* of what is actually being consumed (Zuckerman et al., 1989; Magura and Kang, 1996).

This chapter uses a series of case vignettes in order to describe the effects, mechanisms of action, and negative consequences of drugs other than alcohol and tobacco on students. Figure 1 presents the data available from the Core Institute collected over years of surveys of risky alcohol use (five drinks or more [5+] for a male or four drinks or more [4+] for female on one occasion one or more times during the previous two weeks), 30-day prevalence for marijuana, central nervous system stimulants (cocaine/amphetamines), and hallucinogens/designer drugs. It will not be possible to go through all the drugs used and abused by emerging adults and the patterns of drugs used will change over time. This author regularly goes to an independent web site in order to keep up <http://www.erowid.org> (available 10 September 2008) with the drugs with which I am familiar. Upon such visits I find the pharmacology, dosage, and warnings accurate and without the hyperbole usually associated with drug legalization or drug penalization sites.

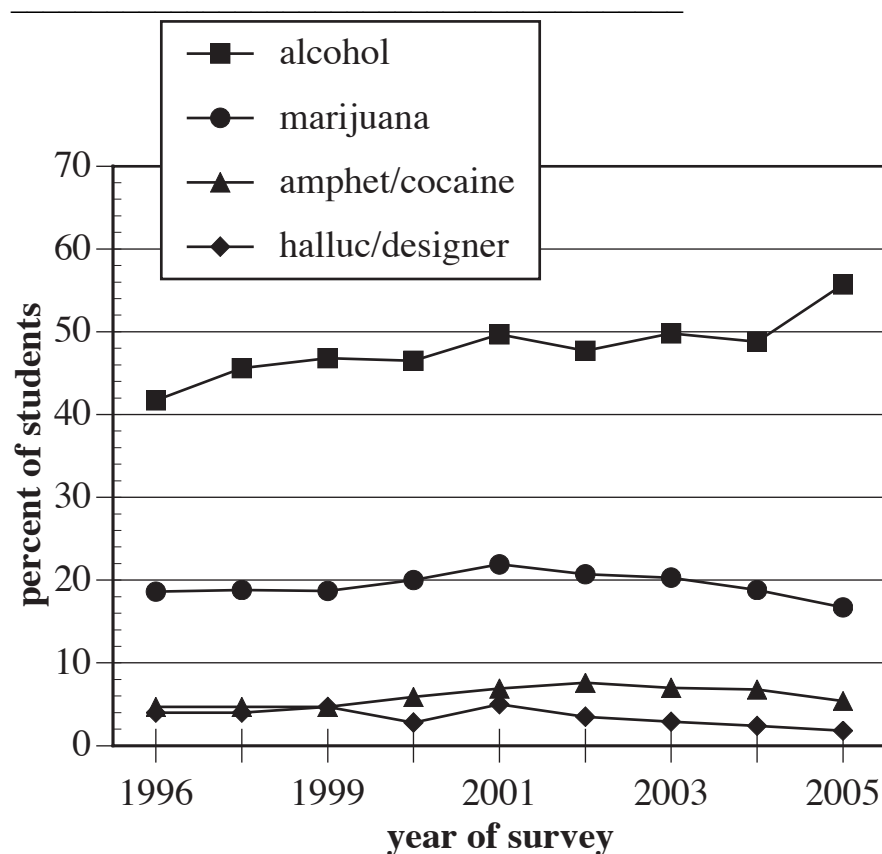


Figure 1. Alcohol, marijuana, combined amphetamine and cocaine, and combined hallucinogen and designer drug use by national samples of college students. Reports from the Core Institute for past 30-day use of the different drugs or one or more episodes of 5 or more alcohol-containing drinks in one setting during the previous 2 weeks. Note: self-report of cocaine use increased from 1.6% in 1996 to 2.4% in 2005, but combined with amphetamine use there is little change. No explanation for the difference in risky alcohol drinking for 2005. There were 89,874 students in the 1995-1996 aggregate data set and 33,379 in the 2005 data set. (available at www.siu.edu/~coreinst/library.htm).

Marijuana

Every year a list of names for marijuana that runs four columns of small print on a PowerPoint© slide is shown to the medical students. These students are then asked to provide any additional names for marijuana of which they have become aware; there are always a couple of new names provided each year. Whatever the name, marijuana use is reported frequently: in our surveys at

this institution over one third of undergraduate students use marijuana and the data available on the Core Institute web site indicate that current marijuana use holds at an almost constant 20% of respondents shown in Figure 1.

As regards the consumption of cannabis or marijuana, the dried leaves are smoked in order to produce a rapid high that produces a pleasant calming effect for most users. The chemicals in marijuana have other effects that the users are unaware of as demonstrated in the first case below:

Case #1:

Mary comes into the infirmary for the third time during summer session. Her genital herpes has erupted, again. Her first visit was the last Thursday in May and now in July she has come again. She is an otherwise healthy 20-year old student, 64 inches tall and 135 lb. Physical exam reveals no other abnormalities and vital signs are normal. Upon questioning about the eruption Mary reveals that these occur about every two weeks and always in the middle of the week. When questioned about what she was doing during the week before each eruption, Mary relates that her boyfriend is an actor in an outdoor summer theater located 6 hours drive away and that she visits him every other weekend. Further probing reveals that the troupe likes to sit around after the last Saturday show, smoke pot and do improvisations. She is prescribed valacyclovir (Valtrex®) and told to stop smoking marijuana.

Many viral diseases lie dormant for years after an initial infection and erupt when the immune system is suppressed. Cold sores (herpes simplex), shingles (herpes zoster), genital herpes, and genital warts (human papilloma virus) are some examples of viruses that may lose suppression due to the use of marijuana. One of the effects of marijuana is to suppress the activity of the CD4 T-helper cells of the immune system (Klein et al., 1985; Klein 2005; Lu et al, 2006). In Mary's case, she would smoke marijuana on a weekend, the T-helper cell counts would reach a nadir about Wednesday and the herpes would erupt. The immune system would recover by the Saturday after smoking, the herpes would scab over and she would be mostly healed by the time she went to visit her boyfriend again and then start the cycle over. When Mary's immune system reached its nadir, not only was it unable to maintain suppression of the existing herpes viral infection, but she would be much more susceptible to infection by a new virus, as well.

Case #2:

Bill followed his daily routine for a day when he was not scheduled for classes. He and his girlfriend lived in a rented house on the edge of town and he would start such class-free mornings by walking with his dogs, a marijuana cigarette in hand. Around 9:30, Bill and his girlfriend shared a second joint. Shortly after lunch, they got into his car and headed down the road away from town in order to get to a new shopping center. As they drove down the two-lane state highway where the speed limit went up to 55 mph he could see two cars come around the bend towards him. The second car began to pass the first. As the second car accelerated towards him, and Bill was accelerating past 55 mph, he panicked and pulled his car hard to the right. The passing car pulled back into its lane, but Bill's car fishtailed, crossed back onto the road and went sideways into the front of the oncoming first car. Bill and the other driver were slightly injured, but his girlfriend and a passenger in the other car were badly hurt and all four people were transported to the hospital. Bill explained to the investigating trooper that he had to jerk to the right to avoid the passing car. The drivers of both the first and second cars said that there was adequate space. A toxicology screen of Bill revealed the presence of delta9-tetrahydrocannabinol (THC) and metabolites. Bill insisted that he was not high by the time he started driving, which was 4 hours after he had finished smoking the marijuana. The lawsuit against the driver of the passing car failed.

Although the mood or psychological altering effects of marijuana are well known, the effects on motor coordination are not well appreciated by the general public of users. THC from marijuana mimics the action of certain endogenous lipids in the brain, e.g., anandamide, to stimulate a specific receptor on neurons known as the CB1 receptor (cannabinoid type 1 receptor). Activation of the CB2 receptor was responsible for the suppression of the immune system in the first case. Both receptors are members of the guanine-protein coupled receptor (GPCR) family of membrane protein receptors. When THC binds to this receptor, the G-protein is released in order to activate an enzyme and alter a signaling cascade inside of the neurons. The altered metabolic state of those neurons that express this receptor in turn changes responses to other neurotransmitters in the brain and this produces the mood and cognitive effects. But the ability of the user to time events is changed also. Interestingly, this effect is not recognized by the user and persists long after the high has dissipated (Yesavage et al., 1985; Leirer et al., 1989). It is likely that stimulation of this cannabinoid receptor accounts for the fall in luteinizing hormone (LH) and follicle stimulating hormone (FSH) in blood of young male heavy marijuana abusers and with the consequence of testosterone levels that are about half of controls (Diamond et al., 1986; Brown and Dobbs, 2002).

Another issue in Case #2 is the effect of a positive blood or urine screen for cannabis use on viability of law suits or workers' compensation claims of which most students will be unaware not to mention probably not care about anyways. A young non-college worker at a local warehouse in Eastern Carolina had his leg broken by a forklift, but his blood test was positive for marijuana. His request for worker's compensation was denied. In Case #2, the defense attorneys obtained reports of the effect of marijuana on the ability of individuals to time events that indicated deficits in performance could last at least 24 hours (Yesavage et al., 1985; Leirer et al., 1989). Any jury would be hostile to begin with given that the plaintiff was a young drug-using individual who had tested positive; the lawsuit was not viable.

More "Gateway drugs"

For lack of a better term, there are several methods middle school and high school students use to get a cheap high. When the term "gateway drugs" is used, people often think of alcohol, tobacco and marijuana. However, anything that is inexpensive and available to a juvenile that can be exploited to produce a high will be used. Added to the list then are items such as cough and cold medications (dextromethorphan and alcohol), inhalants (spray paint, paint thinner, glues, etc.), mother's little nerve pills (typically Xanax® or Ativan®) or father's pills for his back pain and so on. Use of these drugs and materials can continue as the individual gets older, although many stop using in favor of alcohol and marijuana and a few move on to more dangerous drugs.

Dextromethorphan is marketed as a cough suppressant and is found in many over-the-counter cough and cold remedies. When first developed, the trade name for this drug was Robitussin®, but the name is now used for a brand of different products, some of which have no Robitussin in them. This poses a problem for the health practitioner because a statement that "I took Robitussin," or Triaminic® or Coricidin®, etcetera does not give sufficient information to know what combination of drugs was consumed and what the dangers are. Not knowing can be lethal:

Case #3

Sylvia is a 17-year old petite, five foot, 95-pound freshman, living away from home for the first time. One weekend her roommate and friends left for their respective homes and she was bored. On Saturday afternoon, Sylvia walked over to a drugstore and bought two boxes of 20 caplets of Coricidin HBP® maximum strength flu formulation. Probably, the words "maximum strength" caught her attention. Her friends in high school had used from about 20 - 40 pills. When she

returns to her room, she consumed two pills with a beer and waited for an hour. Nothing untoward happened, so she took the rest of the pills with a second beer. After about 30 minutes she experienced a mild euphoria and felt agitated and then more of a sensation similar to the couple of times when she had smoked marijuana. After another 60-minutes, Sylvia had a “fuzzy feeling” and this was not as pleasant. Her experiences ended after about four to five hours, but her mouth was dry, she could feel her heart racing and she had tremors. By Monday afternoon, Sylvia was not feeling well at all and told her roommate what she had done on Saturday. Tuesday morning she called her parents to come get her, but did not tell them what she had done. Tuesday evening, Sylvia’s parents find a very sick child who is nauseated and complaining of severe pain in her right upper abdomen, and exhibits some evidence of jaundice. They take her to the emergency room, but it is too late. The attending physician explains that N-acetylcysteine (Mucomyst®) should have been started within 8 hours of consumption of an overdose of acetaminophen. Hepatic encephalopathy and renal failure follow. Sylvia became comatose and died from acute liver failure two days later.

The cause of death was not the dextromethorphan, but the acetaminophen that was combined in the formulation. The Coricidin formulation that was consumed contained 15 mg dextromethorphan-hydrobromide, 500 mg acetaminophen and 2 mg chlorpheniramine-maleate. The dry mouth, rapid heart rate (tachycardia) and tremors were due to the chlorpheniramine in the formulation. This is an old first generation anti-histamine, but it also blocks the muscarinic receptors for acetylcholine, that function to slow the heart and stimulate exocrine glands, and it has a strong local anesthetic effect that was the cause of the tremors and could have caused a cardiac arrhythmia. Juveniles who obtain a high from dextromethorphan (DXM) sometimes call it “robotripping” or “skittling.” The latter name because some brands of pills look like the candy Skittles®. The high from dextromethorphan is presumed to be due to its ability to bind to two types of receptors in the brain: the sigma₁ receptor and the PCP (phencyclidine or “angel dust”) acceptor site inside of the NMDA receptor for the neurotransmitter glutamate. Drugs that bind to the PCP site are used as dissociative anesthetics (e.g., ketamine or amongst illicit users known as “super K” and “K hole”), so named because patients will have their eyes open and have an awake EEG pattern, but not respond to pain and not remember events. For cough suppression, a dose of 15 – 30 mg of drug is typically used. The high effects begin with doses around 100 mg and the strong dissociative effects may take a dose as high as 1000 mg. To obtain that much drug from pills with chlorpheniramine or acetaminophen in the formulation will be lethal. Regular DXM users know which pills to take and which to avoid.

The lethal danger of chlorpheniramine is that in addition to blocking histamine H_1 receptors, and a weak antagonism of acetylcholine muscarinic receptors, it is also a local anesthetic that can both alter the cardiac EKG and act in the brain to produce seizures. The normal electrocardiogram will show a P-wave for the depolarization of the atria, the Q-R-S complex for ventricular depolarization and then the T-wave for ventricular repolarization in preparation for the next beat. Like all of the members of a long list of drugs with full or partial local anesthetic effects, chlorpheniramine will increase the time from the Q-wave to the T-wave in the EKG. If the T-wave is pushed into the P-wave, an arrhythmia known as “torsades de pointes” can result that is often fatal. The effect is due to a blockade of a certain type of K^+ channel. Cocaine and its metabolite benzoylecgonine, usually thought of as inactive, have a strong effect on the Q-T interval. Drugs that have a partial effect will add with other drugs that possess this dangerous side effect. That poses a danger when a potent local anesthetic such as cocaine is mixed with another drug that prolongs the Q-T interval. Another danger is that since this is a K^+ channel responsible for the effect, drugs that reduce K^+ in the plasma will increase the risk. An example would be a female student worried about her body weight who uses her mother’s “water pills” not knowing that K^+ is going out, too.

If the dose of chlorpheniramine does not reach lethal levels, there remains the problem with acetaminophen in these pills. Hepatotoxicity is observed with doses over 150 mg/kg and lethality with doses over 300 mg/kg. Sylvia’s weight translates to 44 kg, divide into one box of pills (20 pills X 500 mg) and the result is 227 mg/kg. One and a half boxes will easily put the dose into the lethal range. A small proportion of a dose of acetaminophen undergoes nitrogen-oxidation by the liver’s cytochrome P450 system to form N-acetyl-benzoquinoneimine, a highly toxic intermediate. Normally, the sulfhydryl group on glutathione reacts and inactivates the metabolite. However, in a large overdose the availability of glutathione is insufficient to inactivate all of the metabolite formed and the reactive chemical attacks the macromolecules inside the hepatocytes causing cellular injury and death. Treatment should be started immediately upon suspicion of acetaminophen overdose with N-acetylcysteine that will restore glutathione levels and inactivate the metabolite (Roberts and Morrow, 2001). If you do not know your drug formulations, robotripping can be very dangerous.

Inhalants are associated with middle school aged children, but some continue to use for the fast, short and inexpensive high. The Core Institute surveys report that about 1.0% of the students have used inhalants during the past 30 days with little change over the years. Paints, paint thinners, glues and other materials have a variety of solvents in them such as toluene, xylenes and other organic compounds. The affect on the brain is similar to alcohol, but carries with it both neurotoxicity and hepatotoxicity such that regular usage can cause a great deal of damage (Balster, 1998). There are also immediate dangers associated with use of inhalants.

Case #4

A group of students is sitting in a residence hall room in the evening and are passing around a brown paper bag. Each student takes a turn placing the bag over mouth and nose and inhaling deeply. Perhaps because of a loud noise down the hallway, one student suddenly leaps up and starts running out the door and down the hallway. He gets about 15 feet and falls over. Students in the hallway watch him and after a few moments of laughter realize that he is not breathing. The RA is alerted and calls emergency, but attempts at CPR fail.

It was later determined that a tube of plastic cement (airplane glue) had been split open and placed in the bag. The students would place the bag over mouth and nose and inhale deeply in order to get a rapid euphoric effect. When the student jumped at the sound of a noise and started running, his adrenal glands probably kicked in and dumped adrenaline (epinephrine) into his vascular circulation. One of the effects of organic solvents and gasoline is to sensitize the conduction system of the heart to catecholamines such as adrenaline. The result is that a number of ectopic foci outside of the sinoatrial node (the normal pacemaker for the heart on the right atria) start action potentials that result in a lethal cardiac arrhythmia. Death is almost instantaneous once these arrhythmias start and prompt CPR is required if the individual is to survive until cardio-conversion can be performed.

Every few years I read a newspaper report of a group of teen-agers transported to an emergency room due to ingestion of Jimson weed (*Datura stramonium*) seeds or tea (Centers for Disease Control and Prevention, 1995; Spina and Taddei, 2007). This plant is also known as the thorn apple, locoweed and madhatter. It seems that rumors go around that the seeds or a tea made from the leaves have a hallucinogenic effect and can be used to get a “high.” The *Datura* family of plants all contain large quantities of belladonna alkaloids, atropine, scopolamine and others, that can be fatal if taken in a high enough dose (Urich et al., 1982; Spina and Taddei, 2007). The following case is from my graduate school days:

Case #5

David received a phone call from a friend at his alma mater. During the conversation his friend Jane stated that she had taken some Jimson weed seeds three days earlier and her eyes were still dilated and she had to suck on ice chips so she could talk and she was wondering what was in the seeds. David said he

would ask his roommate, Brian: he was almost a doctor and would know. Told the symptoms, Brian looked up from his Goodman & Gilman 4th edition and said, “Tell her she has belladonna poisoning.” From across the bedroom, could be heard from the phone, “Belladonna! Nobody told me that they contained belladonna!” Why had Jane taken the seeds? Seems that two male friends had each consumed 200 seeds. One died outright and the other was picked up barefoot and shirtless in the dead of winter in the middle of the main street through Champaign, IL waving at all of the cars going by. Jane decided that it was really neat stuff, but 200 was too many. So she took 75 seeds. An hour later, her heart felt like it was trying to get out of her chest and she could feel her temperature climbing. She did not seek help.

This person did not get much of a high and the hallucinations were not that pleasant. If she had gone to the emergency room or student health, the physicians would have had to distinguish tachycardia and fever due to CNS stimulants such as amphetamines or cocaine from belladonna poisoning or heatstroke (an event during winter rules out heatstroke). In both cases, the eyes will be dilated: the stimulants increase the amount of norepinephrine on the radial muscle of the iris and cause dilation, while the anti-muscarinic drugs block acetylcholine at the circular muscle and prevent its contraction also causing dilation of the pupil. The mydriasis due to anti-muscarinics will prevent constriction due to a light shined into the eyes. In addition, the bowels will be quiet, the skin hot and dry, and the buccal cavity and conjunctiva will be dry, also.

This case also illustrates the thought process, or lack of, used by these emerging adults. The University of Illinois library had over seven million volumes at that time and I am sure there was more than one tome on the medicinal properties of xenobiotics. Did Jane research what had killed her friend before she swallowed the seeds—NO!; probably explains why she was a fifth year senior. The students will trust the information from their friends and dealers before they will trust a health professional. I maintain that by definition a drug dealer is not a reputable person. There are a large number of plant products that are used for different effects; many have anti-muscarinic chemicals in them similar to belladonna either as the main source of effects or a by-product. The young individuals are told that something will produce a high, and into the mouth or up the nose it goes. Dr. Workman’s chapter on *edgeworkers* in this monograph addresses this phenomenon. Another issue is that virtually everyone who takes these different plant materials is unaware that they contain belladonna poisons. Further, there are a great many prescription drugs that have anti-muscarinic side effects including the first generation anti-histamines such as diphenhydramine (Benedryl®) and chlorpheniramine (Chlor-Trimeton®) both of which are found in many OTC (over-the-counter) preparations—NOTE: The author found a list of 70 OTC combination products that had chlorpheniramine as one of the drugs).

The principal source of belladonna is a plant *Atropa belladonna* commonly known as the “deadly nightshade,” whose name should tell you something. The main chemical present is atropine, which is still used medically today in order to block the neurotransmitter acetylcholine from stimulating muscarinic receptors, of which there are five types and all are members of the GPCR family of receptors described above. Belladonna alkaloids including atropine, scopolamine, hyoscyamine, and several related compounds are found in seeds and bulbs of many plants and there are many drugs that have side-effects largely due to their ability to block muscarinic receptors. Muscarinic stimulation slows the rate of depolarization of the sinoatrial node to decrease heart rate and decreases conduction velocity across the heart. Muscarinic receptors also stimulate gastric and intestinal smooth muscle contractions, constrict the circular muscle of the iris to cause miosis (pinpoint pupils), and stimulate exocrine glands to increase salivation and sweat. In addition, the detrusor muscle of the bladder contracts and the trigon sphincter relaxes in response to cholinergic muscarinic stimulation and allows the initiation of the urine stream and emptying of the bladder. The peripheral effects of blocking muscarinic receptors will be the opposite of the above—tachycardia, mydriasis (dilated pupils), decreased bowel activity, inability to urinate, and decreased secretions. The description is:

Blind as a bat

Red as a beet

Dry as a bone

Hotter than Hades

Mad as a hatter

The last effect is the cause for abuse of these drugs. Those anti-muscarinic drugs that cross the blood-brain-barrier will antagonize muscarinic receptors that are found in many different brain areas. A low level of inhibition produces a mild sedating effect, but as the dose is increased the effect becomes excitatory and hallucinatory rather than going on down to sleep. Unfortunately, for those trying to obtain a “high” by consuming these plants, the hallucinatory dose is very close to that needed to cause shut down of the cardiovascular centers in the brain, coma, and death.

Stimulants

Three basic types of stimulants are being abused on campuses at the close of the first decade of the 21st Century. As the Core Institute data show, cocaine use continues. Methamphetamine abuse also has made an appearance. Then there is the list of attention deficit/hyperactivity disorder (ADHD) drugs that includes various formulations of amphetamine salts (for example, Adderall® or methylphenidate, Ritalin® and Concerta®). Thus, sources of the drugs include street sales of partially purified material with by-products and adulterants added, or diversion of prescriptions for treatment of ADHD. All of these drugs have the property of increasing the amount of dopamine released from dopaminergic neuronal nerve endings (McMillen, 1983). In low doses, attention to task is increased in ADHD and normal individuals (Rappoport et al., 1978), but in large doses the effect is a strong activation of behaviors up to and including a schizophrenic-like paranoia. Although activity appears reduced after low doses of stimulants, insomnia and lack of appetite will be present. When the effect of drug wears off, the effects on the individual become the opposite: rebound hyperactivity followed by sleep.

For the college administrator, there are two types of abuse of these prescription drugs: first, are those who use someone else's prescription to help with studies, the proverbial "all nighter" common to college students; and second, the abuse of several pills in order to get a frank high. The use of cocaine or methamphetamine will be to get the high and has nothing to do with studies. The abuse of diverted prescription ADHD drugs as "smart pills" has attracted much notice lately. Although illegal, compare the relative health risk of 20 mg of Adderall® with a handful of No-Doze® washed down with a strong pot of coffee, which was the way we pulled all-nighters back in my day.

The stimulant drugs may be divided into two categories: amphetamines and non-amphetamines. The former includes amphetamine (**alpha-methyl-phenylethylamine**), methamphetamine and a large number of analogs. The latter includes cocaine, methylphenidate, phenmetrazine and a variety of other drugs. Dopamine, like most small molecule neurotransmitters has its action terminated by being transported back into the nerve ending where it can either be re-stored and re-used or catabolized by the enzyme monoamine oxidase. Amphetamine binds to the dopamine transporter protein (DAT) along with sodium ion and is pumped in, then the transporter once free of amphetamine and sodium will reverse and carry dopamine out—"exchange diffusion." In effect, amphetamines cause the neurotransmitter transporters to run backwards (McMillen, 1983). The non-amphetamines bind to the transporter protein, probably at a site different from where the neurotransmitter itself is bound, and prevent the transporter from working. In the case of norepinephrine and serotonin, these neurotransmitters accumulate in the extracellular space of the synapse. In the case of dopamine, there is in addition an enhanced release of dopamine from

storage sites in the nerve ending—“neurogenic overflow.” Although cocaine and methylphenidate each have similar affinities for the transporters of all three major monoamine neurotransmitters, they give a bigger kick to the release of dopamine (McMillen et al., 1980; McMillen, 1983). However, norepinephrine and serotonin will have their actions potentiated as well, but not to the same degree as dopamine. It is important to remember that norepinephrine is an important neurotransmitter for the peripheral autonomic nervous system as well as in many different areas of the brain and the peripheral sympathetic nerves have the same norepinephrine transporter protein, NET, at their nerve endings:

Case #6

John is a 21-year old male student brought by two friends across the quad to the student infirmary. He is combative, confused and uncooperative with the staff. With difficulty, vital signs were obtained: pulse = 139; blood pressure = 172/115; temperature = 103.2° F. His pupils are dilated and sluggish, skin is diaphoretic (red and wet), lungs are clear and bowel sounds are present. The conjunctiva and buccal cavity are moist. He remains combative and is tremulous with rigid muscles. EMS is called and an intramuscular injection of 2.5 mg of lorazepam (Ativan®) made. When EMS arrives six-minutes later, the student is somewhat calmer, but still has a high pulse rate and blood pressure. In the emergency room, vasodilator treatment with nitroprusside is begun in order to bring down the blood pressure, but his temperature continues to climb and his temperature is now 105.5°. A toxicology screen is positive for large amounts of amphetamines. A rapid sequence intubation is performed and John is transferred to ICU and cooling with wet blankets is done. The rapid cooling brings his temperature down to 99.5° in about 30 minutes.

The physician must make a differential diagnosis for someone who has both tachycardia and elevated body temperature. Body temperatures in many of these cases can exceed 106° F with the lethal effect of damaging the brain, liver, kidneys and other organs. Cooling is important as part of the treatment. Potential causes include heat stroke, belladonna poisoning (as in Case #5), and a sympathomimetic toxidrome as in this case. John had grabbed a handful of his roommate's ADHD prescription and swallowed them, presumably to get a speed high. The excessive release of norepinephrine accelerated his heart through stimulation of beta₁-adrenoceptors and constricted his blood vessels through stimulation of alpha₁-adrenoceptors. As his body temperature climbed, his body attempted to cool down by increasing production of sweat. Treatment is to first calm the patient with a benzodiazepine and then bring down the blood pressure with a vasodilator. If the tachycardia persists, then a beta-blocker may be used,

but only if the blood pressure is under control. There is a risk when using a beta-blocker first in order to slow the heart that the unopposed alpha-adrenoceptor stimulation will increase blood pressure dramatically with lethal consequences. These would include blow out of the middle cerebral artery, vasospasm of a coronary artery or a branch of the mesenteric artery and infarction of the tissue.

The action of the central nervous system stimulants is to increase the release of dopamine from the nerve ending in limbic forebrain structures. An alternative mechanism that will increase the release of dopamine is to make the dopaminergic neurons fire faster and thereby cause the release of more neurotransmitter at their nerve endings. Morphine and alcohol have this effect (Davis et al., 1970; Matthews and German, 1984). And marijuana, or THC, has this effect for a subset of dopaminergic neurons (Chen et al., 1990). All three classes of drugs have their action blocked by opiate antagonists such as naloxone. When stimulants increase the release of dopamine, feedback mechanisms reduce the firing rate of the neurons (Bunney et al., 1973). Most drugs with addictive properties share this ability to release dopamine through one or another mechanism (Koob, 1992). By combining drugs, one that works at the nerve ending and one that works at the cell body, a synergism for the release of dopamine will occur and this explains the mixing and matching of these drugs. Although scientists did not figure this out until the early 1990's, drug addicts knew about the combined effects of cocaine (nerve endings) and narcotics (cell bodies) at least one hundred years ago (Butler, 1908, p. 240): "Some of the most deplorable cases of drug-habit are the combined morphine and cocaine habitués."

Then there are the changes that occur with regular use. Thirty years ago Ellison and co-workers (1978) demonstrated in a rodent model that two weeks of infusion of amphetamine would result in a prolonged depression of dopamine concentrations in the brain that lasted at least 120 days. Daily injections of amphetamine or a non-amphetamine stimulant for two weeks will produce a prolonged change in the concentrations of serotonin and its metabolite (McMillen et al., 1991). Thus, this altered brain chemistry results in a prolonged period of changing psychological depression, altered hedonic responses to rewards and biochemical changes in the individual's brain (Volkow et al., 2004; Porrino et al., 2007).

Knockout drugs

The original knockout drug was chloral hydrate. For at least a few nights, chloral hydrate will produce sleep with a balance of slow-wave sleep and rapid-eye-movement sleep and has a half-life for elimination of about 8 hours. This sedative-hypnotic agent has been around for more than 100 years and remains an effective sleep-inducing agent. The drug was famously employed

to knock people out by addition of either crystals or drops of concentrated solution into someone's drink: a "Mickey Finn." Chloral hydrate is extremely soluble in water and diluted has little or no taste. Interestingly, the drug exhibits both a pharmacodynamic synergism with alcohol, both are sedating and enhance each other's effect, and a pharmacokinetic synergism. Alcohol dehydrogenase in the liver is the principal metabolic enzyme for ethanol with NAD as the co-factor and acetaldehyde and NADH as the products. This enzyme can then use the NADH in reverse and reduce chloral hydrate to the more active drug, trichlorethanol. This is an unusual example of a pharmacokinetic enhancement. As a knockout drug, it is unusual to find crystals of chloral hydrate, however syntheses may be found on internet web sites, as well as for a great many other drugs.

Today, the two major drugs of concern as knockout drugs are flunitrazepam (Rohypnol®, or 'roofies') and sodium-gamma-hydroxybutyrate (GHB, sodium oxybate or Xyrem®). Although the result can be the same, the two drugs are very different. Flunitrazepam will be discussed first and two different case vignettes used to illustrate the differences.

Flunitrazepam is a very potent member of the benzodiazepine family of drugs that includes diazepam, alprazolam, lorazepam and many others. It has two properties that the other drugs do not: it is water-soluble and has little taste in solution. Chlordiazepoxide (Librium®) is water soluble, but has a delayed after taste that you can drive a truck through (personal observation). Most of the other members of the family are not readily soluble in water. The benzodiazepine drugs all work by binding to the GABA_A receptor to make more receptors available for the action of the neurotransmitter GABA (gamma-aminobutyric acid). The result is that the GABA-chloride channels open with greater frequency and hyperpolarizes the neuron, which makes the neuron less likely to discharge and there is an increase in CNS inhibition. Zolpidem (Ambien®) binds to a subset of the receptors and has less anti-anxiety or anti-epileptic action. Ethanol also increases the activity of this ligand-gated channel and inhibits one class of the excitatory glutamate receptors, also. Hence, the synergism that is observed when these chemically different classes of drugs are mixed:

Case #7

Kim is a 22-year old college student who presents at about 3:00 pm to the local emergency room in order to request a rape exam. She had taken "a drink or two" in her apartment about 10:00 pm before joining two other female students at a club in the downtown district next to the campus. At about 2:00 am, she had been talking with two new male friends when she left her drink unattended to use the powder room. She awoke at 2:00 pm in her car in a parking lot 2 miles from campus. Kim called her friends, but they recalled leaving while she was talking with the two men. Kim sat in her car for a bit and then decided to drive to the

hospital. In addition to the rape exam kit, a urine sample is taken for a toxicology screen and comes back positive for benzodiazepines and the follow-up test is positive for flunitrazepam, specifically.

Flunitrazepam is a very potent drug. As little as 1.0 or 2.0 mg of drug can seriously debilitate someone, especially when combined with alcohol, and the drug has a half-life of about 14 hours plus an active metabolite. Those benzodiazepines that have a very high affinity for the GABA_A receptor, triazolam, alprazolam and flunitrazepam, will produce the greatest degree of amnesia (Erowid.com lists “forget-me pill” as one of the slang names for flunitrazepam). Thus, a victim can be in a semi-comatose and compliant state for several hours, but will have no memory of events. This makes the drug very useful for predators and very dangerous for people who leave their drinks unattended.

It is important to note that the use of flunitrazepam as a knock out drug is rare. Rather, most use of this drug appears to be by those who like to use “downers.” My personal observation is that alcohol abusers prefer depressant drugs with half-lives of elimination in the 10 – 14 hour range and that would include alprazolam, lorazepam and flunitrazepam and several of the barbiturates, e.g. pentobarbital and secobarbital. This half-life appears to match up with the elimination of alcohol and the onset of withdrawal symptoms in a heavy user. **Error! Contact not defined.**, a local substance abuse counselor, once stated to me, “Xanax and Ativan are the M&M’s of alcoholics.” Another substance abuse counselor, himself in recovery for over 15 years, said that “Xanax was the world’s best dry martini.”

GHB was once thought of as an analog of GABA, but this small molecule is a naturally occurring substance in the brain and has its own specific receptors (Doherty et al., 1978). The chemical may be closed into a ring to form gamma-butyrolactone that has better CNS penetration and then will be hydrolyzed back to GHB. There are additional analogs with similar activity. In large doses, GHB may stimulate both its own receptors and the GABA receptors and will severely sedate the individual, produce a weak anesthesia, and it causes the dopamine neurons to stop firing (Walters and Roth, 1976). In addition to the dopaminergic neurons that are part of the motor control and limbic pathways, there is a small group of dopaminergic neurons that release dopamine into the circulation from the median eminence of the hypothalamus to the pituitary and the released dopamine will inhibit the release of prolactin and growth hormone. If, a big if, GHB inhibits the release of dopamine by these neurons, then there would be an expected increase in the release of growth hormone. Thus, the interest in this drug by body builders; however, the evidence that non-anesthetic doses produce the effect is lacking. The drug is marketed as Xyrem for the treatment of narcolepsy and has been used successfully in Italy for the treatment of

alcoholism (Gallimberti et al., 1992; Caputo et al., 2005). GHB is highly water-soluble and provides a minimal taste when mixed into a drink:

Case #8

Emily and Jacob were 20 and 21 year-old upperclassmen who shared an apartment near campus. A friend had invited them to an informal open party at his fraternity house just a few blocks away. They had consumed two to three beers each when another non-member came in and started passing around a 20 oz. soda bottle that contained a clear liquid. “Drink this, it’s neat! It’ll get you high quick.” Emily and Jacob each took a swig out of the bottle. The liquid tasted a bit sour or basic. About 30 minutes later, and after another beer for Jacob, both were not feeling well and decided to go home, but collapsed on the thin grass strip between the road and a Miami Subs restaurant about halfway to their apartment. The bodies were spotted, EMS called, and rescue arrived quickly. Jacob quits breathing in route to the emergency room and the paramedic applies respiratory assistance, while Emily is close to the same condition. Upon arrival at the hospital the attending physician notes a young comatose male not breathing and exhibiting myoclonic jerks. Rapid sequence intubation for ventilation is performed. Blood is drawn for a stat toxicology screen. Jacob suddenly awakens and extubates himself before staff can react. Emily too is now in an awake but disoriented state and able to breath adequately on her own. The toxicology screen comes back negative except for alcohol.

Emily and Jacob were very fortunate **not** to have made it back to their apartment. If they had, they would have asphyxiated and died due to the combined depressant effects of GHB and alcohol. The duration of action of GHB is relatively short, hence the patient suddenly awakes enough so as to feel the tube down their trachea and struggle with it. Another reason that GHB was never used as an anesthetic was both the large depression of respiration and the appearance of myoclonic-like seizures at high doses of drug in humans, but I have never seen myoclonus in rodents (McMillen and Shore, 1980). Once dissolved, it is impossible to know how much is in a “swig” or a capful and the synergism with alcohol is very dangerous as illustrated in the case above. The advantage to a user is that a capful will rapidly hit like a six-pack of beer, but when combined with an actual six-pack the drug may become lethal. An additional note, routine toxicology screens are not set up for the detection of GHB.

Hallucinogens

Drugs that have agonist actions at receptors for serotonin (chemically, 5-hydroxytryptamine) receptors, particularly the 5HT_{2A} receptor and yes, this is a member of the large GPCR family of receptors, will produce a variety of hallucinogenic effects. Lysergic acid diethylamide, LSD, is a very potent 5HT_{2A} receptor agonist and still shows up on campuses. The serotonin-releasing drug 3,4-methylenedioxymethamphetamine (MDMA or ecstasy) is still being used along with a variety of related amphetamine analogs or drugs that have the indoleamine structure found in serotonin. One can think about this as a matter of degrees. One class of antidepressant drugs blocks the serotonin transporter protein, SERT, that removes serotonin from the synapse and transports it back into the nerve ending. These drugs are often called SSRI's, although the drugs are not selective and the process is called "uptake-1" so the correct term would be serotonin uptake inhibitors or SUI's. The effect is a modest increase in the amount of serotonin reaching all of its many different receptors throughout the brain. Also, 90% of the serotonin in the body is located in the enterochromaffin cells of the gut where it induces contractions of the bowel and 5% is in the platelets that scavenge serotonin released by the enterochromaffin cells of the gut that gets into circulation. Both have the same SERT protein in order to recover released serotonin. Nausea, diarrhea and poor platelet function are side effects of these anti-depressant drugs due to their mechanism of action. Then there is LSD, bufotenin, and other various tryptamine and phenylethylamine analogs that are direct agonists of one or more of the serotonin receptors. Finally, there is MDMA and other O-methyl amphetamines that appear to have a potent amphetamine-like action on the SERT to pump serotonin out and cause a strong stimulation of all of the serotonin receptors:

Case #9

James is visiting his girlfriend Joanie at her apartment. Both are finishing a beer when he pulls out a baggie with a few white pills. James tells his girlfriend that these are supposed to be "neat stuff" and offers her one, but Joanie refuses. He pops one. After about 30 minutes and another beer, James appears agitated and is staring at objects first here and then there. He then collapses and Joyce calls 911. James arrives in the ER semi-conscious, eyes open and pupils dilated and sluggish and is in restraints in order to control his purposeless movements. Pulse is 116 beats per minute, respirations are 18 per minute, BP is 137/87 and he is afebrile. James is unable to answer questions. Joanie arrives and states that he had taken a white pill that James said contained 2C-B. James is given a dose of lorazepam and his vital signs and EKG monitored. Recovery takes about 36 hours.

If the pills contained 2C-B as described, then the drug consumed presumably was 4-bromo-2,5-dimethoxyphenylethylamine, a designer drug similar to mescaline in chemical structure. The phenylethylamine portion gives the drug some stimulant properties while the methoxy groups lend LSD like properties. On the street it is also known as “Nexus” and “Bees” and probably several other names. As the abuse of MDMA has declined, other phenylethylamine or inoleamine analogs have come in to fill the void. The user has no idea what actually is in the “white pills” and often times testing reveals a chemical different than what was stated. Consider that these drugs are made in local basements and underground laboratories in the Netherlands and Mexico, not by Eli Lilly or GSK under Food and Drug Administration approved GMP conditions. One morning several years ago, about 2000, I was reading in the local newspaper a story about a seizure of thousands of MDMA pills near here when my then high school junior bounded down the stairs. I looked up from the paper put down my coffee and asked, “Jerome, is there much ecstasy around Rose High School?”

“Dad, it’s everywhere.”

I narrowed my eyes and asked. “Have you taken any?”

“No, Dad.”

“Why not?” was my final question.

“I don’t know who made the stuff” he responded. And, then I let him have at his breakfast.

Although his answer would not have been at the top of my list for not taking MDMA, it showed that he was at least thinking. Maybe something from our conversations had rubbed off on him. Too many individuals do not give a thought to the issues of manufacture, who to go to if an adverse event occurs or who they would sue if one occurs. The dealer will be long gone. And, adverse events will occur:

Case #10

Julie is a 19-year old college student living in the residence halls. It is Friday night and she and her friends are planning to go dancing at a club downtown. Worried about ABC enforcement, the girls “front end load” with several drinks in their rooms at about 10:00 pm and then walk to the club. Julie gets an underage ID bracelet from the doorman, orders a soda and pops a yellow pill with a tulip stamped on it. The club is packed, the music is loud, and Julie is crowded in on the dance floor. Suddenly, like a wave washing over her she does not feel well: she is sweaty and can feel her heart racing. She stumbles into the restroom and collapses. It is at least 30 minutes before her friends realize that she is missing, locate her, try to revive her with cold water to the face, and finally take her

outside and then call 911. The ER physician notes a young well developed female with pupils at 6 mm and sluggishly reactive to light, diaphoretic skin and no response to questions, but purposeless movements. Pulse = 188; respirations = 20; blood pressure = 124/58; temperature = 107.5° F. Rapid sequence intubation is made and Julie is transferred to ICU. Temperature continues to rise, reaching 108° F and intensive cooling efforts have a gradual effect and finally the temperature is down to 99° F after two hours. Day 2 brings hepatic failure, brain death, disseminated intravascular coagulation and hemorrhagic death.

The autopsy by the medical examiner revealed a large concentration of MDMA in Julie's blood. The drug is known to be a hyperthermic agent in humans (Freedman et al., 2005) and it has been suggested that females may be more sensitive to the effects of MDMA than males (Allott and Redman, 2007). Serotonin is a potent hyperthermic agent in the hypothalamus where the input of this neurotransmitter from the brainstem regulates several "setpoints" including temperature, hunger, thirst, blood pressure and control of the pituitary hormones by the hypothalamus (Myers, 1975). The danger is not limited to the acute intoxication: MDMA is known to be neurotoxic to serotonergic neurons in monkeys (Ricaurte et al., 1992) and humans (McCann et al., 1998) and has long-term depressive effects on both mood and cognitive abilities in humans (Morgan, 1998; McCardle et al., 2004). A major cause for poor cognitive scores of past MDMA users is an increase in impulsivity that prevents subjects from withholding wrong responses (Morgan, 1998; Quednow et al., 2007), a well known effect in rodents after neurotoxic depletion of serotonin (Iversen, 1984) or inhibition of serotonergic cell activity (Thiebot et al, 1979). Acute lethality and long-term lesions of my serotonergic system would top my list of reasons to not take MDMA.

However, the potential for toxicity does not stop people from mixing and matching in order to see if they can get some effect better than before. Found in an Internet site (Disembodied Eyes) was a description by a person who decided to mix 3 grams of "Syrian rue" with a half tablet of MDMA. The effect came on in 15 minutes despite a full stomach and developed a state of "psychedelic stonedness rather than empathogenic empathy." Then the person reported that he realized that his blood pressure was going high and his nose began to bleed, but even though he or she had a blood pressure cuff, could not use it for several hours until they had enough control and then got a reading over 145 mm Hg. At 18 hours the person describes their pupils as dilated, face red as a tomato and veins protruding from the forehead. It was two days before the blood pressure was back to normal. The problem this individual had was that Syrian rue, *Peganum harmala*, contains several alkaloids that can either inhibit the enzyme monoamine oxidase that is responsible for the metabolism of serotonin or bind to serotonin receptors in addition to a variety of other effects that include production of tremors (Rommelspacher et al., 1994; Grella et al.,

1998; Mehta et al., 2003). Thus, the MDMA was pumping out serotonin via the SERT and once out the alternative mechanism for termination was blocked by harmine, harman, harmaline and other alkaloids, with the result that the serotonergic receptors were swamped.

Narcotics

The Core Institute Student Survey data indicate that about one percent of college students abuse opiates during the previous 30 days. This may be in the form of popping pain pills or actually injecting drugs. The receptors for narcotics are the mu, delta and kappa receptors and all are members of the GPCR family and work by altering the amount of second messengers inside of the cells. Morphine is a potent mu-receptor agonist and through stimulation of this receptor produces relief from pain, but also euphoria, respiratory depression, sedation and constriction of pupils or miosis and in the gut inhibits the release of acetylcholine to cause constipation. Coma, pinpoint pupils and depressed respiration is the triad of narcotic overdose. Morphine, heroin (diacetyl-morphine), codeine, oxycodone (Oxycontin® and Percodan®, with acetaminophen is Percocet®), hydrocodone (with acetaminophen, Vicodin®) and methadone are all mu-receptor agonists. Naloxone (Narcan®) and naltrexone (ReVia® or the injectable Vivitrol®) are mu-receptor antagonists. Meperidine (Demerol®) is a mu-receptor agonist, but also a weak inhibitor of the SERT and that makes it particularly dangerous if mixed with a monoamine oxidase inhibitor: the result can be the serotonin-syndrome similar to case #10 above that includes hallucinations, tremors and a fever that can be lethal.

There is a population that is particularly susceptible to the euphoriant effects of narcotics. Anytime I meet with a group of narcotic addicts and the conversation dies down, I simply ask them to “Tell me about the void.” They will then excitedly describe how the first time they took narcotics, especially by injection, that “the void” that had always existed at the center of their being filled up with warmth and that for the first time they felt whole. However, the first time that the void is filled is the best time and the rest of their addiction has been about getting that feeling back. As they develop tolerance to the effects of the drugs they get further and further away from the feel of the first time and their use is to just get close to their original state. Hence the term “chasing the ghost,” which is that feeling realized the first time the drug was used. When talking to these individuals, it is obvious that something is very different in their response to narcotics from most of the rest of us. What that difference is, and it must be a brain chemical difference, has not been identified. One of the clients at the nearby North Carolina inpatient treatment center, Walter B. Jones, Sr. Alcohol and Drug Abuse Treatment Center, shared a poem with me. She was a petite Caucasian in her early 20’s who would fit right into any undergraduate classroom without notice, but had delivered a baby girl four months before while

she was on methadone. The poem presents many of the aspects of narcotic addiction (the name she gave me was an alias):

The Want....

The want, the need, the urge to feed.
The race, the chase, the want for the numb,
The hunting and fighting
For this that never comes.

I don't know how I got here,
Or if I can return.
It started as a game,
But now I live to feel the burn.

From the time my eyes fall shut,
Until the dewy dawn;
The only peace time from this
Thing I chase
That's gone before it comes.

-Shawnee P.

Notice that her drug use began as an experimentation; actually she started with alcohol when she was 12 years old, marijuana at age 13 or 14 and began using harder drugs by age 16. By age 18 she was heavily into the use of narcotics. The reader can tell from her last verse that she no longer derives pleasure from her drug use. I do not know whether or not she spent any time in college and I have not had any contact with her since 2002:

Case #11

Two students both 21 years old, Matt and Daniel, share an apartment. Matt has experimented with narcotics and while home on break has learned to use Oxycontin pills for injection. Daniel has tried different drugs, but seldom narcotics. Matt has purchased two orange pills and shows them to his friend. First, Matt has them each take 10 mg of loratidine in order to prevent itching. He dissolves the sugar coat with his tongue for a few minutes, as does Daniel with the pill given to him, then they crush the matrix, add a few drops of water and mix

thoroughly. They then absorb the water onto a cotton swab in order to eliminate particles and then dip the swabs into more water in order to elute the drug off of the swabs. Matt shoots his up and his friend follows. Daniel falls backwards off of the bar stool before he can get the needle out and does not move while Matt is nodding. Finally, Matt realizes that there is a problem and calls 911. Daniel is brought to the ER and the attending notes constricted pupils, respiration rate of 6, BP 112/60, and little response to shouted questions. She orders 2.0 mg of Narcan, waits 5 minutes and then another 2.0 mg. Daniel's respiration rate picks up and he becomes able to respond to questions.

The problem here for Daniel was that he had not used narcotics and had little tolerance in contrast to his roommate. Matt had purchased two Oxycontin tablets with 40 mg each of oxycodone that are approved for use by patients with severe chronic pain. Pain is an effective antidote to the depressant effects of narcotics, but Daniel was not a pain patient. Without any tolerance, the dose was too much for Daniel. Fortunately, Matt had enough consciousness left that he could realize the danger to Daniel and call for help. The ER often experiences the narcotic overdose cases in waves as a new batch of heroin with higher than usual purity or a new technique for using pills and high dose drugs goes through the drug using community. Oxycodone and hydrocodone come in a variety of doses, pill formulations, capsules and liquids, almost all of which are designed for oral consumption. Some abusers will simply crush the entire pill to a fine powder and then either swallow or insufflate (snort) the drug in the hopes of getting a faster rush from the drug. Others find ways to separate the drug from most of the matrix and then inject. However, 40 mg spread over 12 hours by time-release for a chronic pain patient may have little sedative or respiratory depressive effect, but for a non-pain patient without the slow release this dose can be fatal.

Matt had purchased his pills from a prescription drug shopper—someone who is skilled at making the rounds of doctors' offices and uses all of the right buzz words to get the drugs they want. The going price for these narcotics is about one dollar per milligram according to the clients at the local in-patient facility. The doctors each have 40 puzzles to solve every day and it is rare that the shopper walks out without the prescription that he or she wants; this is the person's profession and livelihood. Then in your residence halls will be some students who are the pharmacy for the entire hall as the students trade and sell pills and tablets that they obtain from different sources (Inciardi et al., 2007). Many of these will be "pain pills." Extracting the drugs from pills is not easy, but there are web sites that tell you how to do it (<http://www.heroindiaries.com/InjectingGuide.html>, available 10 June 2008). The www.erowid.com web site has in its "Erowid Experience Vaults" many postings from

individuals, including several college students, who mostly have crushed and then insufflated the fine powder.

Summary

This review has covered a great many drugs. Unfortunately, there are many more in use and others that will be discovered, and then there is the information circulated on the Internet. There exists a cadre of young people who are constantly experimenting with different plant products and different syntheses and then testing combinations of products, often on themselves. The Internet allows for these individuals to communicate amongst themselves and information spreads quickly. My emergency physician friend, Bill Meggs, says that he too uses www.erowid.org to keep abreast of the changes in substances and patterns of use. It is assumed that the difference in each individual's brain chemistry creates the difference in preferences for drugs from different classes and the different combinations. What those differences are is not clear. However, any new drugs will likely fall into one of the categories above and act on the same target sites: stimulants, depressants, narcotics or hallucinogens.

Drugs with the risk of addiction will promote the releases of dopamine, at least initially. Part of the loss of effect is the depletion of dopamine. There is a group of individuals who appears to like the hedonic effects of increased dopamine release. Then there are those who like the hallucinogenic effects. Compounding the problems for the health professional who tries to treat the medical issues is that many of the drugs consumed are synthesized in underground laboratories or are from plant products without known content and then adulterants are added that may produce additional adverse effects. Too much of anything will be toxic or as Paracelsus put it 500 years ago: "All things are poison and nothing is without poison, only the dose permits something not to be poisonous." In their course on pharmacology, our medical students learn this phrase the first day and are constantly reminded throughout the course that all drugs are poisons.

References

- Allott, K, and Redman, J (2007) Are there sex differences associated with the effects of ecstasy/3,4-methylenedioxymethamphetamine (MDMA)?. *Neurosci Biobehav Rev* 31:327-47.
- Balster, RL (1998) Neural basis of inhalant abuse. *Drug Alcohol Dependence* 51:207-214.
- Brown, TT and Dobs, AS (2002) Endocrine effects of marijuana. *J. Clin. Pharmacol.* 42(11 Suppl):90S-96S.
- Bunney, BS, Walters, JR, Roth, RH and Aghajanian, GK (1973) Dopaminergic neurons: effect of antipsychotic drugs and amphetamine on single cell activity. *J Pharmacol Exp Ther* 185:560-571.
- Butler, GF (1908) *A Text-Book of Materia Medica Pharmacology and Therapeutics* 6th ed, WB Saunders Co:Philadelphia.
- Caputo, F, Addolorato, G, Trevisani, F, Bernardi, M (2005) Gamma-hydroxybutyrate as a treatment for alcoholism. *Lancet.* 366(9490):981-982.
- Centers for Disease Control and Prevention (1995) Jimson weed poisoning--Texas, New York, and California, 1994. *MMWR - Morbidity & Mortality Weekly Rep.* 44:41-44.
- Chen, JP, Paredes, W, Li, J, Smith, D, Lowinson, J and Gardner, EL (1990) Delta 9-tetrahydrocannabinol produces naloxone-blockable enhancement of presynaptic basal dopamine efflux in nucleus accumbens of conscious, freely-moving rats as measured by intracerebral microdialysis. *Psychopharmacol* 102:156-162.
- Davis, VE and Walsh, MJ (1970) Alcohol, amines and alkaloids: A possible biochemical basis for alcohol addiction. *Science* 167:1005-1007.
- Diamond, F, Ringenberg, L, MacDonald, D, Barnes, J, Hu, CS, Duckett, G, Sweetland, M and Root, A (1986) Effects of drug and alcohol abuse upon pituitary-testicular function in adolescent males. *J Adolescent Health Care* 7:28-33.
- Doherty, JD, Hattox, SE, Snead, OC and Roth, RH (1978) Identification of endogenous gamma-hydroxybutyrate in human and bovine brain and its regional distribution in human, guinea pig and rhesus monkey brain. *J Pharmacol Exp Ther* 207:130-139.
- Eaton, DK, Kann, L, Kinchen, S, et al., (2006) Youth Risk Behavior Surveillance---United States, 2005. *MMWR* 55(No. SS-5).

- Ellison, G, Eison, MS, Huberman, HS and Daniel, F (1978) Long-term changes in dopaminergic innervation of caudate nucleus after continuous amphetamine administration. *Science* 201:276-278.
- Freedman, RR, Johanson, CE, Tancer, ME (2005) Thermoregulatory effects of 3,4-methylenedioxymethamphetamine (MDMA) in humans. *Psychopharmacol* 183:248-256.
- Gallimberti, L, Ferri, M, Ferrara, SD, Fadda, F and Gessa, GL (1992), Gamma-Hydroxybutyric acid in the treatment of alcohol dependence: a double-blind study, *Alcohol Clin Exp Res* 16:673–676.
- Grella, B, Dukat, M, Young, R, Teitler, M, Herrick-Davis, K, Gauthier, CB and Glennon, RA (1998) Investigation of hallucinogenic and related beta-carbolines. *Drug Alcohol Dependence* 50:99-107.
- Inciardi, JA, Surratt, HL, Kurtz, SP and Cicero, TJ (2007) Mechanisms of prescription drug diversion among drug-involved club- and street-based populations. *Pain Medicine* 8:171-183.
- Iversen, SD (1984) 5-HT and anxiety. *Neuropharmacol* 23:1553–1560.
- Kann, L, Kinchen, SA, Williams, BI, et al. (1998) Youth risk behavior surveillance -- United States, 1997. *MMWR* 47(No. SS-3).
- Klein, TW (2005) Cannabinoid-based drugs as anti-inflammatory therapeutics. *Nat Rev Immunol* 5: 400-411.
- Klein, TW, Newton, CA, Widen, R, Friedman, H (1985) The effect of delta-9-tetrahydrocannabinol and 11-hydroxy-delta-9-tetrahydrocannabinol on T lymphocyte and B lymphocyte mitogen responses. *J Immunopharmacol* 7:451-466.
- Koob GF (1992) Drugs of abuse: anatomy, pharmacology and function of reward pathways. *Trends Pharmacol Sci* 13:177-184.
- Leirer, VO, Yesavage, JA, and Morrow, DG, (1989) Marijuana, aging, and task difficulty effects on pilot performance. *Aviation Space & Environ Med* 60:1145-52.
- Lu, T, Newton, C, Perkins, I, Friedman, H, Klein, TW (2006) Cannabinoid treatment suppresses the T-helper cell-polarizing function of mouse dendritic cells stimulated with *Legionella pneumophila* infection. *J. Pharmacol. Exp. Ther.* 319:269-276.
- Magura, S, and Kang, SY (1996) Validity of self-reported drug use in high risk populations: a meta-analytical review. *Substance Abuse and Misuse* 31:1131-1153.

- Matthews, RT and German, DC (1984) Electrophysiological evidence for excitation of rat ventral tegmental area dopamine neurons by morphine. *Neurosci* 11:617-625.
- McCann, UD, Szabo Z, Scheffel U, Dannals RF and Ricaurte GA (1998) Positron emission tomographic evidence of toxic effect of MDMA (ecstasy) on brain serotonin neurons in human beings. *Lancet* 352:1433–1437.
- McCardle, K, Luebbers, S, Carter, JD, Croft, RJ and Stough, C (2004) Chronic MDMA (ecstasy) use, cognition and mood. *Psychopharmacol* 173:434-439.
- McMillen, BA (1983) CNS stimulants: two distinct mechanisms of action for amphetamine-like drugs. *Trends Pharmacol Sci* 4:429-432.
- McMillen, BA, German, DC and Shore, PA (1980) Functional and pharmacological significance of brain dopamine and norepinephrine storage pools. *Biochem Pharmacol* 29:3045-3050.
- McMillen, BA, Williams, HL and Scott, SM (1991) Effects of subchronic amphetamine or amfonelic acid on rat brain dopaminergic and serotonergic function. *J. Neural Transm.* [Gen. Sect.] 83:55-66.
- McMillen, BA and Shore, PA (1980) Role of dopamine storage function in the control of striatal tyrosine hydroxylase activity. *Naunyn-Schmiedeberg's Arch. Pharmacol.* 331:39-44.
- Mehta, H, Saravanan, KS and Mohanakumar, KP (2003) Serotonin synthesis inhibition in olivocerebellar system attenuates harmaline-induced tremor in Swiss albino mice. *Behavioural Brain Res.* 145:31-36.
- Morgan, MJ (1998) Recreational use of "ecstasy" (MDMA) is associated with elevated impulsivity. *Neuropsychopharmacol* 19:252-264.
- Myers, RD (1975) Impairment of thermoregulation, food and water intakes in the rat after hypothalamic injections of 5,6-dihydroxytryptamine. *Brain Res* 9:491-506.
- Porrino, LJ, Smith, HR, Nader, MA and Beveridge, TJ (2007) The effects of cocaine: a shifting target over the course of addiction. *Prog. Neuro-Psychopharmacol Biol Psychiatr* 31:1593-1600.
- Quednow, BB, Kuhn, KU, Hoppe, C, Westheide, J, Maier, W, Daum, I and Wagner, M (2007) Elevated impulsivity and impaired decision-making cognition in heavy users of MDMA ("Ecstasy"). *Psychopharmacol* 189:517-530.
- Rapoport, JL, Buchsbaum, MS, Zahn, TP, Weingartner, H, Ludlow, C and Mikkelsen, EJ (1978) Dextroamphetamine: cognitive and behavioral effects in normal prepubertal boys. *Science* 199:560-563.

- Ricaurte, GA, Martello, AL, Katz, JL, and Martello, MB (1992) Lasting effects of (\pm)3,4-methylenedioxymethamphetamine on central serotonergic neurons in non-human primates. *J Pharmacol Exp Ther* 261:616–622.
- Roberts, LJ and Morrow, JD (2001) Analgesic-antipyretic and anti-inflammatory agents and drugs employed in the treatment of gout. in The Pharmacological Basis of Therapeutics, 10th ed, eds. Hardman, JG, Limbird, LE and Gilman, AG, NY:McGraw-Hill, pp. 703-704.
- Rommelspacher, H, May, T and Salewski, B (1994) Harman (1-methyl-beta-carboline) is a natural inhibitor of monoamine oxidase type A in rats. *Eur J Pharmacol* 252:51-59.
- Spina, SP and Taddei, A (2007) Teenagers with Jimson weed (*Datura stramonium*) poisoning. *CJEM Can. J. Emerg. Medical Care* 9:467-468.
- Thiebot, MH, Jobert, A and Soubrie, P. (1979) Effets compares du muscimol et du diazepam sur les inhibitions du comportement induites chez le rat par la nouveaute, la punition et le non-reinforcement. *Psychopharmacol* 61:85–89.
- Urich, RW, Bowerman, DL, Levisky, JA and Pflug, JL (1982) *Datura stramonium*: a fatal poisoning. *J. Forensic Sci.* 27:948-954.
- Volkow, ND, Fowler, JS and Wang, GJ (2004) The addicted human brain viewed in the light of imaging studies: brain circuits and treatment strategies, *Neuropharmacol* 47(Suppl 1):3–13.
- Walters, JR and Roth, RH (1976) Dopaminergic neurons: an in vivo system for measuring drug interactions with presynaptic receptors. *Naunyn-Schmiedeberg's Arch Pharmacol* 296:5-14.
- Yesavage, JA, Leirer, VO, Denari, M and Hollister, LE (1985) Carry-over effects of marijuana intoxication on aircraft pilot performance: a preliminary report. *Amer J Psychiatr* 142:1325-1329.
- Zuckerman, B, Frank, DA, Hingson, R, Amaro, H, et al. (1989) Effects of marijuana and cocaine use on fetal growth. *New Engl. J. Med.* 320:762-768.

Additional Resources

- Brenner, GM and Stevens, CW (2006) *Pharmacology*, 2nd edition. Saunders-Elsevier:Philadelphia.

Brunton, LL, Lazo, JS and Parker KL, eds (2006) Goodman & Gilman's The Pharmacological Basis of Therapeutics, 11th edition. McGraw-Hill Companies:New York.

Cooper, JR, Bloom, FE and Roth, RH (2003) The Biochemical Basis of Neuropharmacology, 8th edition. Oxford University Press:Oxford.

Nestler, EJ, Hyman, SE and Malenka, RC (2001) Molecular Neuropharmacology: A Foundation for Clinical Neuroscience. McGraw-Hill Companies:New York.

About the Author

Brian A. McMillen, Ph.D. is a Professor of Pharmacology & Toxicology, Brody School of Medicine, East Carolina University, Greenville, NC 27834. He can be reached at mcmillenb@ecu.edu

Prevention Strategies for Prescription and

Other Drugs on College Campuses

Valerie LaMastro, Ph.D.

Rowan University

Most college administrators, along with campus alcohol and other drug (AOD) specialists, are quite aware that the development of appropriate prevention programming is complex and must take into account the unique features of a particular campus environment as well as distinctive aspects of the student body. It has also become increasingly clear that simple programs limited to addressing AOD issues alone will have little impact on individual student use of these substances given the scope of the problem and the well-entrenched culture in which it exists. Such statements may be particularly accurate with respect to the collegiate use of prescription medications, as the rise of misuse of these drugs on college campuses is a relatively recent phenomenon, and as such has not been fully addressed in most prevention programming to date (see also Brian McMillen's chapter in this monograph regarding this phenomenon).

According to the U.S. Department of Education's Office of Safe and Drug-Free Schools, an "environmental management" approach that impacts upon students themselves as well as the collegiate and surrounding community affords the best chance of affecting the campus culture regarding the use of alcohol and other drugs. Such programs involve a comprehensive emphasis on decreasing the availability of substances on campus as well as in the surrounding community, and creating alternative social activities so that the use of substances becomes less appealing to students. Overall, the goal of an environmental management approach is to change the culture of a campus so that the normative and expected behavior of students is in alignment with an emphasis on educational accomplishment and personal growth and health².

Additionally, when addressing prescription drug use on campus, it is critically important to note that education regarding the dangers of such substances may generally be less thorough than that provided to adolescents and young adults about alcohol, marijuana, and other drugs. Accordingly, although education and information alone are insufficient to serve as a primary

² For more on *Environmental Management Strategies* see <http://www.higheredcenter.org/environmental-management> (last visited 22 September 2008).

prevention technique, correcting myths and misinformation about prescription drug use is likely to be an important focus for prevention professionals.

According to *Facts on Tap* (see <http://www.factsontap.org>), a college-based alcohol and drug prevention program headquartered at Phoenix House, a well-known addiction treatment facility, the “societal attitudes” toward prescription medications are a significant contributor to the ignorance surrounding their possible abuse. Unlike illicit drugs, of course, prescription medications are approved by the Food and Drug Administration and typically prescribed by physicians, and are therefore surrounded by an aura of “safety” that makes it easier to downplay or rationalize the potential dangers associated with their use. It is important for educational material related to prescription drugs to emphasize that such substances are safe only when used as indicated, and that when the substances are misused or shared with others for whom they were not intended, there could be serious and unpredictable reactions.

An additional danger of prescription medication that should be emphasized in educational programs is the effect that such substances can have when mixed with alcohol, a potentially common scenario given the prevalence of alcohol use on college campuses. Most prescription medications, particularly those with high potential for abuse such as opiates or amphetamines, come with specific warnings against using alcohol concurrently with the medication. According to *Facts on Tap*, approximately 25% of all emergency room visits for drug-related purposes involve the combination of alcohol with one or more medications, an interaction of which many people may be unaware.

An emphasis on educating students about the dangers of prescription drug abuse may also increase the perceptions of risk associated with their use, which although is unlikely to eliminate the collegiate problems associated with the misuse of these medications is likely to be an important component involved in the personal choices of individual students regarding the use of these substances. Recent research indicates that approximately one quarter of first year college students perceive “great risk” in the occasional non-medical use of prescription stimulants and pain relievers, which of course are the two most prevalent categories of prescription drugs encountered on college campuses (Arria, Caideira, Vincent, O’Grady & Wish. 2008). A similar percentage of students expressed the view that such occasional use of prescription medications posed little or no risk, a factor that was strongly associated with actual use. The remaining half of the students surveyed apparently perceived a moderate risk associated with these substances, and may represent a group for whom educational interventions could be particularly fruitful.

Additionally, Arria and her colleagues (2008) found that the personality variable known as sensation seeking, which is associated with a strong desire for novel and unusual experiences, was related to the tendency not to be dissuaded from the use of the substances even if a strong risk was perceived, suggesting that personality may be a critical variable to consider when planning appropriate prevention campaigns (see Thomas Workman's chapter on *Edgework* in this monograph). The author's note that high sensation seeking individuals represent an overall higher risk population for drug use, and that "interventions aimed at substituting other novel and exciting activities" (pg. 200) might be an effective way to reach this population. Considering that sensation seeking is often highest in individuals under 25, and that those persons comprise the majority of the college population, it is conceivable that adopting a "one size fits all" approach to prescription drug prevention may not take into account the special needs of a particularly high-risk group.

Despite the need for increased educational efforts to combat misconceptions about the potential dangers of prescription drugs, the primary emphasis for prevention efforts will need to be the broader perspective of environmental management, for it is only with these techniques that an appropriate "saturation" of the campus and surrounding community can be attained and a culture change can potentially be effected. As noted by the U.S. Department of Education's Higher Education Center for Alcohol and Other Drug and Violence Prevention, typical prevention efforts have focused on education, and often involve such activities as skits during college orientation weeks, awareness weeks with special programming and information presented by peer educators and/or Residence Life staff, and sometimes "curriculum infusion" efforts in which AOD information is presented by faculty members in the context of their classes. Whereas each of these methods has its place, evidence overall suggests that education alone is insufficient to effect lasting change or reach a critical mass of students. Regarding these types of prevention approaches as "stand alone" efforts, the National Institute on Alcohol Abuse and Alcoholism has labeled them as "Tier 4" or "ineffective" (see <http://www.collegedrinkingprevention.gov/StatsSummaries/4tier.aspx> last visited 16 October 2008).

A fundamental assumption of the environmental management approach is that decisions about AOD use are made in the context of the broader campus culture, which includes factors related to the community within which the institution is located, the economic and judicial climate of the campus and surrounding area, and the social reputation and interpersonal milieu of the school. Based on principles of the public health model, environmental management strategies recognize that institutions of higher learning do not exist in a vacuum, and that prevention efforts must reach beyond the walls of the campus to include other related entities if those efforts are to be

successful. According to the Higher Education Center, “college officials cannot expect students to say ‘no’ to binge drinking and other drug use when their environment is telling them “yes.”

The Center for College Health and Safety (see <http://www.campushealthandsafety.org> last visited 16 October 2008) funded by the Robert Wood Johnson Foundation, notes that environmental change efforts encompass several distinct but inter-related areas. Although their emphasis, like that of others, has primarily been on the prevention of dangerous alcohol consumption, several of their suggestions are relevant to the prevention of prescription drug abuse as well. The Center notes that a variety of substance-free extracurricular and public service opportunities should be available to students, both as alternatives to college social events that emphasize alcohol and substance use and as an opportunity to add meaning to one’s college experience. A healthy normative environment should also be created, in which misperceptions about alcohol and other drug use are debunked. Also supportive of a healthy normative environment are activities that keep students more fully engaged with the academic mission of the institution. Such changes might occur modifying the academic schedule to include more Friday classes, making sure that academic rigor is present in classes, and creating more opportunities for student-faculty interaction and collaboration. Student affairs personnel might also consider establishing or increasing substance-free housing, and making certain that those residential policies are maintained. Furthermore, campus drug and alcohol policies should be enforced and publicized, and law enforcement personnel and community officials should be involved in developing, publicizing, and maintaining policy (see footnote “1” above).

For the past decade, the U.S. Department of Education has sponsored grant competitions focused on developing comprehensive alcohol and other drug prevention programs, and has recognized 34 model programs at institutions throughout the country. In order to be named to this honor, the program must be part of an overall prevention effort at the institution, and must have been demonstrated to be effective in reducing alcohol and drug use and its associated problems. In most cases, such model programs emphasize the prevention of dangerous alcohol consumption, but several either focus on other drugs or could be adapted to do so.

An example of a program that could be adapted to focus more specifically on prescription drugs is the “Judicial System Model” at Utah State University, which was a 1999 recipient of the model program designation. In this effort, students who violated the University’s judicial code with alcohol or other drugs were referred to a six week, peer led program involving education, skills training, self-management and self-monitoring skills, and social norms information. As testament to the program’s success in modifying behavior, many of the peer facilitators were chosen from among graduates of the program, and repeat violations from individuals who

completed the program were nearly non-existent. Similarly, a project implemented by the University of Chicago focused on providing late night substance-free alternative activities for students, and received the model program designation in 2004. One of the explicit goals of this program was to limit the initiation of drug and alcohol use by students who reported feeling high levels of academic stress. In addition to offering students alternative activities, the “Noctis Dero” (or late night) project at the University was designed to promote open dialogue about substances between students, faculty and staff, and build an awareness of campus norms relative to alcohol and other drug use. A final example of environmental management programming that could be adopted to focus on all aspects of substance abuse is the prevention plan developed by Syracuse University, which received the model program designation in 2000. Prevention professionals and judicial officers from Syracuse University worked with community leaders, residents and parents to modify the student judicial system for quicker response and standardized sanctions, as well as to address substance use in off-campus locations. Additionally, the program involved emphasizing late night, substance free social options to students, attendance at which increased measurably after the implementation of other programmatic efforts. Complete information about efforts designated as model problems is available at <http://www.higheredcenter.org/prevention/examples/model/info> (last visited 16 October 2008).

Given the increasing publicity accorded to the abuse of prescription drugs on campus, and the documented rise in their use, it is possible that the average college student may in fact begin to misperceive and overestimate the extent to which his or her peers on campus are using such medications. Such misperceptions form the theoretical basis of the social norms approach to behavior change, a popular method that has received significant empirical support and has primarily been utilized to address alcohol abuse on college campuses for over twenty years³. As noted above, the social norms approach has been an integral aspect of many of the programs designated as “model programs” by the U.S. Department of Education. The social norms approach to AOD prevention provides a novel and accessible method for both changing the attitudes and ultimately, the behaviors of college students. Although the specific tools used in the implementation of a social norms campaign vary considerably depending upon the environment in which it is initiated, the foundation of the method rests upon a fact-based informational strategy designed to educate students about the actual frequency of substance use among their campus peers. The original research, focusing on alcohol consumption, revealed a dramatic misperception among college students as to both the frequency and amount of alcohol consumption taking place on campus, such that students consistently and erroneously believed that the drinking norms on campus were much higher than they actually were (Perkins and Berkowitz, 1986). Almost two decades of subsequent research on widely differing college

³ See <http://www.higheredcenter.org/environmental-management/change/normative/social-norms> for more on “Social Norms Marketing.”

campuses nationwide has indicated a similarly exaggerated belief among diverse student groups, as well as among high school students and young adults in general. The pervasive nature of this misperception is what a social norms campaign sets out to rectify, in the process building upon a number of well-established attitudinal and behavioral phenomena that in many instances helps to both alter the prevailing belief system and reduce actual substance use. Although it has not yet been utilized in this context, the increasing attention given to prescription drugs on campus suggests that it is likely that the social norms approach could represent a viable prevention strategy for this issue as well.

If considering the utility of social norms marketing as one part of an integrated approach to addressing alcohol use on campus then one could extrapolate to its potential for use regarding prescription drugs; it is easy to see how students might conceivably develop misperceptions regarding the frequency whereby their peers are using such medications. Listening to the conversations of other students and exploring the campus and adjacent environs, individual students come to an implicit understanding of the availability of alcohol on campus and the frequency of its consumption, thus forming an attitudinal structure that pushes them to behave in a way congruent with what they perceive as being what “most” other students are doing. Depending upon the individual student’s reference group, the conclusion drawn may be different, but the fact remains that many students will base their understanding of the role of alcohol on their particular campus based upon their understanding and interpretation of the norms they take to pertain to that issue. The most critical tenet of a social norms approach to modifying alcohol-related behavior centers upon the documented knowledge that many norms surrounding alcohol are absolutely incorrect. It is logical, therefore, to assume that such an approach holds merit as a strategy by which to affect student perceptions regarding the use of prescription medications—in addition to illicit drugs. In fact, social norms marketing has been employed to affect individual perceptions in such disparate areas as tobacco use, debut of sexual activity, compliance with paying taxes, to mention but a few (see <http://www.socialnorms.org/CaseStudies/casestudies.php> last visited 16 October 2008).

Initial research on alcohol-related norms conducted by Perkins and Berkowitz (1986) empirically demonstrated dramatic and consistent misperceptions of both attitudes and behaviors among the campus population. Students generally believed that “everybody else” on campus had a much more permissive attitude towards alcohol and other substance use than they themselves maintained. Furthermore, students also believed that their peers were consuming more alcohol and drinking more frequently than they were actually found to be. A key concept in the social norms approach is that individual behavior will be based upon these subjectively perceived norms, thus in many cases leading students to act in accord with a normative influence that is highly inaccurate. Modifying the erroneous norms and informing students in a credible manner

of the actual attitudes and behaviors of their peers will encourage them to model their own actions on a more moderate and healthier reference point.

A propensity to pay special attention to “vivid” behavior and vivid people is also related to the formation of misperceptions about alcohol use on campus. Humans are cognitively primed to notice and remember unusual events taking place around them; such a tendency has profound value in that it helps us approach or avoid circumstances that could be of potential harm or potential benefit. Like many aspects of our perceptual and cognitive systems; however, this tendency to attend to and recall vivid aspects of our surroundings does not always serve us in an accurate manner. A person using or selling opiates on campus will certainly be noticed, remembered, and discussed with others long after the fact. Furthermore, the human decision making process almost guarantees that this vivid incident will be recalled more easily than the more mundane background information about the majority of students who are not using the drug. According to research on the availability heuristic, we tend to remember events that are more accessible in memory, and vivid information by definition is more accessible.

Also evident in the construction of misperceptions is the common phenomenon of pluralistic ignorance, in which the individual (or “social perceiver”) believes that the majority of others feel and behave in a much different fashion than they actually do (Toch and Klofas, 1984). The social perceiver in this case also erroneously assumes that these “others” feel and behave in ways quite different from him or herself. An example might be the morose of the adolescent who believes that “everybody else” is enjoying a remarkably active social life, when in fact very few individuals in her reference group are having nearly as much fun as she imagines they are. To avoid embarrassment and appear that she is indeed like others her own age (or at least her perception of them), this person might engage in some behaviors that she doesn’t really wish to take part in, but that she feels will make her seem like the others whose lifestyle she envies.

The connection with prescription drug use is clear. As can be noted in articles focusing on the increase in the use of such medications on campus, it is clear that the majority of students choose NOT to use such substances. However, the majority of students may not in fact realize that they represent the norm, and that students who are using prescription medications in fact represent the exception. If a student feels pressured or encouraged to be “like everyone else” with respect to drug use, it is likely that the student will base his or her behavior on a false interpretation of what others are in fact doing. The heart of a social norms program involves widely communicating the actual, fact-based statistics on campus alcohol and drug use so that pluralistic ignorance can be dissipated and students understand that the majority of their peers are in fact not using such medications.

Although the preponderance of research and programmatic efforts stemming from the social norms approach have been focused on collegiate alcohol use, some have been developed to address the use of marijuana on campus, perhaps providing a more direct similarity to the programs that could potentially be used to address prescription drug use. As noted by Perkins (2002), addressing misperceptions of drug use among peers and providing accurate, research based information about actual normative behavior may be key in reducing substance use among college students. Given that previous research has indicated that students generally believe that “everyone else is smoking marijuana,” when in fact it is a minority of college students who are actually doing so, publicizing such social norms on campus would let students know that marijuana use is in fact not as common as they might believe. This essentially gives students the comfort of knowing that they are “normal” if they choose not to use the substance.

Many campuses throughout the states and elsewhere already have well-developed social norms programs in place to encourage moderate alcohol use among students. Of course, marijuana is an illegal substance and colleges most certainly cannot support even “moderate” use. However, the surveys upon which alcohol social norms programs are developed also typically contain questions about the use of other substances, and data from those surveys could easily be obtained that would likely reveal that most college students are in fact not using prescription drugs and disapprove of their use. The information in the surveys could then be used to create social norms posters and flyers to disseminate information about the low prevalence of and disapproval of such use on campus, much as marketing materials have already been developed to combat dangerous drinking. It is likely that the social norms messages that could help impact prescription drug use on campus are waiting to be discovered in already existing data. Prevention staff on college campuses should make certain that messages about these substances don’t get overlooked in favor of focusing exclusively on social norms messages about alcohol use.

Additionally, research based on marijuana prevention indicates that distributing educational posters, pamphlets, and flyers on campus that address the dangers of the drug can also be an effective strategy. According to Miller, Tosca, Miller, and Sanchez (2000), if such a strategy is to have an impact the information it must address the way in which marijuana “adversely affects the things that *matter* to college students” (pg. 747). Miller and his colleagues developed a Campus Wide Alcohol and Drug Prevention Program at the University of New Mexico, designed to increase the perception among students of the risk of using drugs. One of the high-profile elements of the eighteen-month campaign was the inclusion of a monthly column in the campus newspaper discussing the ways in which substance use impacted upon “memory, and brain functions, social roles, grades, sexuality, career options, and success” (pg. 747). The newspaper

column was part of a much broader, comprehensive educational effort on campus, involving speakers, peer educators, videotapes and referral services. As is somewhat unusual in large field studies, Miller et al. (2000) were able to compare their results with those obtained on a similar college campus that did not utilize such a comprehensive prevention effort. After program implementation, data revealed that marijuana use had declined on the program campus, whereas it actually increased slightly in the control campus. Students on the control campus also indicated an increased perception of the danger of driving with a person who had been using drugs, whereas this effect was not observed in the control campus. Although the majority of behaviors assessed centered upon alcohol consumption, results clearly indicated that behaviors toward marijuana, and some attitudes toward other drug use, were impacted on the program campus. Although the authors note that a number of other factors could potentially have impacted the results obtained, they conclude that their intervention reinforces the need to develop campus-wide programs that are “multifaceted, multilevel, and ongoing” (Miller et al., 2000). Obviously, such an effort is time consuming and expensive, but a complex behavior like substance use is unlikely to be affected by weak or uncoordinated programming.

Creating a campus culture of moderation is an ongoing process, built upon a foundation of unbiased empirical data and energized by the appropriate and consistent reinforcement of positive messages. A number of published case studies demonstrate that social norms marketing campaigns are associated over time with significant reductions in high levels of alcohol use (e.g., Perkins & Craig, 2002, Haines & Barker, 2003). Individualized and cost-efficient, social norms campaigns represent an updated, theoretically justified method of addressing universal prevention efforts with college and university students. Obviously, the benefits of a social norms campaign are dependent upon the quality and credibility of the materials that are used.

Perkins (2002) notes that programs that focus upon communicating accurate norms both “intensively and persistently” are those that are most likely to be related to positive outcomes. Social norms information can be publicized in “student newspaper ads and articles, radio programs, lectures, campus poster campaigns and other public venues” (Perkins, 2002, pg. 169), essentially “saturating” the campus with information about actual drinking norms.

According to “The Main Frame: Strategies for Generating Social Norms News”, a web-based media guide authored by Jeffrey Linkenbach and his colleagues (2002), successful social norms approaches “build upon what is healthy” and work to change what it not. Projects that use a variety of informational techniques and focus on a “positive, inclusive, community-based strategy” are most likely to lead to attitude change and healthy decisions. It is also likely that borrowing methods from advertising and mass marketing can add to the successful impact of a

social norms campaign. For example, utilizing college students (preferably from one's own campus) as models on posters and other materials can create a sense of similarity between those students publicized as making appropriate alcohol consumption decisions and those students who need to be apprised of normative, healthy behavior. Featuring social norms materials at campus social events and other recreational venues can capitalize upon the natural tendency to develop a positive attitude toward something that is linked with an inherently enjoyable event. Developing competitions in which students themselves are given the task of designing and implementing social norms messages could forge a sense of "ownership" of the campaign and add to its visibility and impact. Overall, credibility, consistency, and creativity are the bedrock upon which a successful social norms effort is mounted.

Also extrapolating from the prevention efforts geared toward marijuana, a recent and potentially promising prevention innovation for college students blends both social norms information and motivational interviewing in an on-line assessment format that provides individualized information to the respondent. Modeled after the popular e-CHUG on-line alcohol use assessment, the e-TOKE (Electronic THC Online Knowledge Experience) allows students to answer a series of questions in private concerning their own marijuana use patterns. After completing the short screening, students are provided with personalized feedback about their own consumption of marijuana and how it compares to the consumption of others on their campus (if not athletic team, specific student organization, et cetera). Educational content about the dangers of marijuana use is presented, and information about change readiness and confidence are also provided. Program administrators on campuses utilizing the e-TOKE assessment are also given access to descriptive data from all students on campus using the system, allowing an examination of overall campus patterns and potential changes over time. Although published empirical research about the potential impact of e-TOKE has yet to appear in scientific journals, preliminary data from small studies of the companion e-CHUG as reported on the company website (<http://www.e-toke.com> - last visited 16 October 2008) are suggestive of favorable results with respect to decreased alcohol consumption. It is likely that such on-line programming could and eventually will be developed to address the use of prescription drugs and other substances on campus.

In addition to developing prevention messages geared exclusively to college students, it is important for campus prevention professionals to reach out to high school and even middle school students, as data indicate that prescription drug use is notably on the rise among younger individuals as well. As with alcohol use, it is possible that younger students may have already formed their attitudes toward prescription drugs and begun to use or even abuse these substances. Given that a significant percentage of that population will ultimately arrive on campus, it is important to address prescription drug use among younger adolescents as well.

According to the Office of National Drug Control Policy, prescription drugs are the second most commonly abused drugs (behind marijuana) among adolescents age 12 to 17. Like many college students, younger individuals tend to believe that such substances provide a “medically safe high,” and almost a third believe that prescription drugs are not addictive. The number of adolescents treated for prescription drug abuse has risen by 300% in the last decade, and as of 2004, fully 29% of teens in treatment were dependent upon prescription sedatives and stimulants. Such statistics suggest an increasing crisis among pre-college age youth.

Fortunately, much attention has been devoted to developing prevention programming geared toward adolescents, and educational messages proliferate on various media, as do school and community based prevention programming, with much variability in scope and effectiveness. Many efforts center upon debunking the myths associated with the use of drugs and increasing the awareness of the harm that they can cause; many efforts center upon educating parents about these myths and encouraging them to share the information with their adolescent and pre-adolescent children. A recent example of a multi-faceted educational approach to prevention is the “Time to Talk” campaign recently unveiled by the Partnership for a Drug-Free America (<http://www.timetotalk.org> last visited 16 October 2008). Suggesting that parents who regularly discuss the danger of substances with their children raise children who are less likely to use, the website offers parents free registration that affords them access to a wealth of information about alcohol and drugs, including tips about how to initiate these important but sometimes awkward conversations with children. Additionally, the Partnership for a Drug-Free America has consistently helped to develop television campaigns aimed at addressing adolescent drug use. Although the impact of these particular advertising spots has not yet been assessed, earlier research indicates that messages produced by the organization do indeed have the potential of reaching young viewers. For example, Block, Morwitz, Putsis, and Sen (2002) found that the cumulative impact of anti-drug advertising reduced the probability of trying marijuana by 9.25%.

Empirical evidence also suggests that more specifically targeting prevention messages to particular at-risk groups of adolescents may constitute an effective strategy. The National Center on Addiction and Substance Abuse at Columbia University (CASA), for example, advocates for developing some prevention strategies targeted exclusively to adolescent and college age women, noting that girls are more vulnerable to depression and anxiety, both risk factors for substance use. Additionally, CASA research indicates that girls can develop an abuse problem more rapidly than boys, and in some cases suffer more severe health consequences (CASA, 2003). Although gender differences have yet to receive major emphasis in prevention programming, CASA data suggest that gender-specific efforts are needed.

Another example of the need for targeted prevention focuses on high sensation-seeking youth, who may be at higher risk for substance use and abuse. Palmgroen, Lorch, Stephenson, Hoyle and Donohew (2007) examined aspects of the Marijuana Initiative, a multi-media effort developed as part of the National Anti-Drug Media Campaign by the Office of National Drug Control Policy. Based on research that indicated that earlier campaign efforts were ineffective, the Marijuana Initiative represented a major revision of previous messages, and ran from October 2002 through June of 2003. Messages developed for the Marijuana Initiative campaign were targeted toward at-risk adolescents aged 14 to 16, and featured radio and television spots designed to portray the negative consequences of marijuana use in a “hard-hitting” fashion. Initial analysis of the Marijuana Initiative revealed no positive impact on the target audience, however, a closer look at the initial analyses suggested that the original research might not be examining the data in a manner that provided the most complete information. Palmgroen and his colleagues (2007) subsequently re-examined the impact of Marijuana Initiative messages to ascertain any differential impact of the campaign on high versus low sensation seekers, as it was felt that the original analysis did not analyze the responses of high sensation seekers as a separate group, potentially overlooking any positive changes that could have taken place with these individuals. Indeed, upon additional analyses, Palmgroen et al. (2007) found that campaign messages “had dramatic effects on the marijuana use, attitudes and beliefs” of the high sensation seeking targets. The researchers observed that an upward trend in marijuana use that was noticed among high sensation seekers prior to the onset of the Marijuana Initiative programming was followed by a sharp decrease in use for the six months following exposure to the campaign. Additionally, although actual use appeared to be affected by campaign exposure, there were no differences noted in either alcohol or tobacco use or marijuana social norms that could be attributed to campaign materials. The observed effects did not generalize to low sensation seeking individuals. This was expected given that low sensation seekers have a significantly lower use of marijuana and also was not expected to react as dramatically to the “graphic and stimulating” images presented in Marijuana Initiative materials. The authors interpret the results of their analyses as suggestive of the fact that SENTAR, or sensation-seeking targeting, represents a valid approach to prevention for a group that displays a particularly high risk of marijuana initiation. It is plausible that such efforts might also be extrapolated to develop programming geared toward preventing the use of other substances, including prescription medication.

Additional data supportive of targeting this high-risk population comes from the analysis of the “Jump Start” program, a classroom - based prevention and life skills enhancement program offered to African-American adolescents living in neighborhood environments that constituted an additional risk factor due to high levels of violence and substance abuse. Harrington and Donohew (1997) developed fast paced and stimulating prevention messages geared to high

sensation-seekers, as well as developing more comprehensive program materials focusing on decision making and values clarification, pro-social alternatives to substance use, and the importance of career and vocation. Following program implementation, high sensation seeking youth evidenced greater decreases in both alcohol and marijuana use as well as an increase in negative attitudes toward substances.

Another potentially fruitful avenue for the prevention of collegiate prescription drug use involves encouraging parents to address the topic with their college-bound youth. Parents may represent an under-utilized resource in this regard, as many may believe that it is “too late” to significantly influence the habits of their sons and daughters once college is imminent. The work of Rob Turrisi, a professor of biobehavioral health at Pennsylvania State University, indicates that parental conversation and discussion can have a significant impact upon collegiate drinking. Turrisi, Wiersma, and Hughes (2000) found that communication between mothers and their teenage children about negative alcohol-related consequences was related to a reduced tendency to engage in heavy episodic drinking. Conversations focusing on healthy lifestyle choices and the potentially embarrassing outcomes of being caught drinking on campus appeared to have a positive impact on the alcohol-related choices of the college students. Based upon the potential success of working with parents in this regard, Turrisi and his colleagues have developed a 30-page pamphlet intended to motivate parents to speak to their children about alcohol use on campus, with specific instructions about the type of communication that is most likely to be effective. Although the work has not yet been expanded to explore the impact of parental communication on student marijuana and prescription drug use, it is logical to assume that similar communication techniques might have a favorable impact.

It is unlikely that any one particular program can significantly and consistently impact substance use among adolescents and youth. Rather, coordinated efforts that address multiple risk factors and involve parents, schools and communities are needed to order to assure that prevention messages are disseminated in the right channels and in a suitable format to have an impact upon adolescent beliefs, attitudes, and behaviors. On college campuses, prevention and treatment professionals must work to capture the attention of administrators and increase awareness of the seriousness of prescription drug use, as it is only with “top down” support and funding that the more comprehensive programs that have the highest likelihood of a positive impact can be developed and implemented. When a critical mass of influential people on campus are involved then progress can truly begin.

REFERENCES

- Arria, A., Caideira, K., Vincent, K., O'Grady, K., & Wish, E. (2008). Perceived harmfulness predicts nonmedical use of prescription drugs among college students: Interactions with sensation seeking. *Prevention Science, 9*, pp. 191-201.
- Block, L.G., Morwitz, V.G., Putsis, W.P., & Sen, S.K. (2002). Assessing the impact of antidrug advertising on adolescent drug consumption: results from a behavioral economics model. *American Journal of Public Health, 92*, 1346-1351.
- Haines, M., & Barker, G. (2003). The NIU experiment: A case study of the social norms approach. In Perkins, H.W. (Ed.) *The Social Norms Approach to Preventing School and College Age Substance Abuse: A handbook for Educators, Counselors, and Clinicians*. San Francisco, Jossey-Bass.
- Harrington, N.G., & Donohew, L. (1997). Jump Start: A targeted substance abuse Prevention program. *Health Education and Behavior, 24*, 568-586.
- Linkenbach, J., Berkowitz, A., Cornish, J., Fabiano, P., Haines, M., Johannessen, K., Perkins, H.W., Rice, R. (2002). *The Main Frame: Strategies for Generating Social Norms News, Most of Us*, Montana State University, Bozeman, MT.
- Miller, W.R., Toscova, R.T., Miller, J.H., & Sanchez, V. (2000). A theory-based motivational approach to reducing alcohol/drug problems in college. *Health Education and Behavior, 27*, 744-759.
- Palmgroen, P., Lorch, E.P., Stephenson, M.T., Hoyle, R.H., & Donohew, L. (2007). Effects of the marijuana initiative campaign on high sensation-seeking adolescents. *American Journal of Public Health, 97*, 16.

- Perkins, H.W., & Berkowitz, A.D. (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *International Journal of the Addictions*, 21, 961-976.
- Perkins, H.W., & Craig, D.W. (2002). A multifaceted social norms approach to reduce high-risk drinking: Lessons from Hobart and William Smith colleges. Newton, MA: The Higher Education Center for Alcohol and Other Drug Prevention and the U.S. Department of Education.
- Perkins, H.W. (2002). Social norms and the prevention of alcohol misuse in collegiate contexts. *Journal of Studies on Alcohol, Supplement #14*, 164-172.
- Toch, H., & Klofas, J. (1984). Pluralistic ignorance revisited. In G.M. Stephenson & J.H. Davis (Eds.) *Progress in Applied Social Psychology* (Volume 2, pg. 129-159). New York: Wiley.
- Turrisi, R., Wiersma, K., & Hughes, K. (2000). Binge drinking-related consequences. In college students: The role of drinking beliefs and parent-teen communications. *Journal of Addictive Behaviors*, 14, 342-355.
- U.S. Department of Education, Office of Safe and Drug-Free Schools, *Alcohol and Other Drug Prevention on College Campuses: Model Programs*, Washington, DC, 2008.

About the Author

Valerie LaMastro, Ph.D. is an Assistant Professor of Psychology at Rowan University. She has worked with the Rowan University Center for Addiction Studies as a Research and Prevention Associate since 2002. Dr. LaMastro received her doctorate in social psychology from the University of Delaware in 1995, and specializes in issues related to health psychology as well as organizational behavior. She lives in New Jersey with her husband and 3 daughters. Dr. LaMastro can be emailed at: davis-lamastro@rowan.edu

I Said No to Drugs... But the Drugs Wouldn't Listen!

Michael P. McNeil
Columbia University

This article is based on a presentation of the same name developed for the Meeting of the Minds 2008 Conference held Spring 2008 in Kansas City, Missouri. Please note that while research and suggestions are presented, the author attempted to inject some humor into this discussion to prevent the topic from being a simple restatement of past discussions.

The language of drugs and millennials

The millennial students that are the majority of our learners in higher education today bring a new language to our campuses; and when it comes to drugs, the distinctions are even greater. Try these phrases and see if you can translate:

1. I am so into Batman right now.
2. Who wants to go on a Robotrip?
3. Seriously cafeteria-style!
4. I never realized skiing could be so much fun!
5. She so tripped with a bad rib.

For those less familiar with the language of drugs on campus here are your simplified translations:

1. Some ecstasy comes in tablets with the bat symbol on the tablet and this phrase refers to being interested in this version of the drug.
2. Robotripping is a slang term for using cough medicine containing dextromethorphan to get “high” or experience the hallucinogenic effects that are associated with higher dose dmxx use.
3. Cafeteria-style refers to having a wide variety of drugs (usually in pill form) to choose from. Just pick what you want and use it. Often associated with “pharming” or improper use/abuse of prescriptive drugs.
4. Skiing is a slang term for using cocaine. This term is widely used in online communities to refer to cocaine use so as to not openly admit to using an illegal drug.
5. Rib is a slang term for rohypnol, a hypnotic sedative that is related to Valium and not legal in the United States.

See, that wasn't so hard. If we in the prevention and treatment fields are going to be effective in our roles it is incumbent on us to remain up to date with the language. Simple strategies like browsing online communities, having lunch in a campus dining hall, or talking with students can

provide insight into the terminology that is popular at any given time. Additional information on language will be discussed later in this article.

About millennials

Generally speaking, millennials are students born between 1982 and 2002. This means that they will graduate from high school between 2000 and 2020, earn a first bachelors degree between 2004 and 2024, and that the first wave are now entering the workforce. This group is also known as the Net Generation, Echo boomers, the iGeneration, and the DARE Generation.

As a population, millennials tend to share the following characteristics:

- Structured rule followers
- Protected and sheltered
- Confident and optimistic about their future
- Conventionally motivated and respectful
- Hold conventional values & seek traditional lifestyles
- Cooperative and team-oriented
- Averse to individual recognition
- Pressured by and accepting of authority
- Admire consistency in rules & actions
- View ritual as “ties that bind” community
- Risk-averse and afraid of failure
- Dress is more uniform than previous generations
- Do not want to stand out from their peers or to be perceived as loners
- Core values of uniformity and conformity
- Talented achievers
- Think more highly of themselves
- Prefer group academic and social projects, but do not like sharing bathrooms, group showers or undressing in front of other
- Score higher on scales of warmth, sensitivity, apprehension, openness to change, reasoning, emotional stability, and social boldness

Using this information it is interesting to consider issues around drug use. It would not be difficult to imagine the use of “study drugs” in a population afraid of failure. At the same time we can realize that the number of young people that might use heroin would decline as the isolation from peers would not be comfortable and they are more likely to follow social rules about not using illicit drugs.

To provide a brief example of some drug-related behaviors that have been noted with this generation, consider:

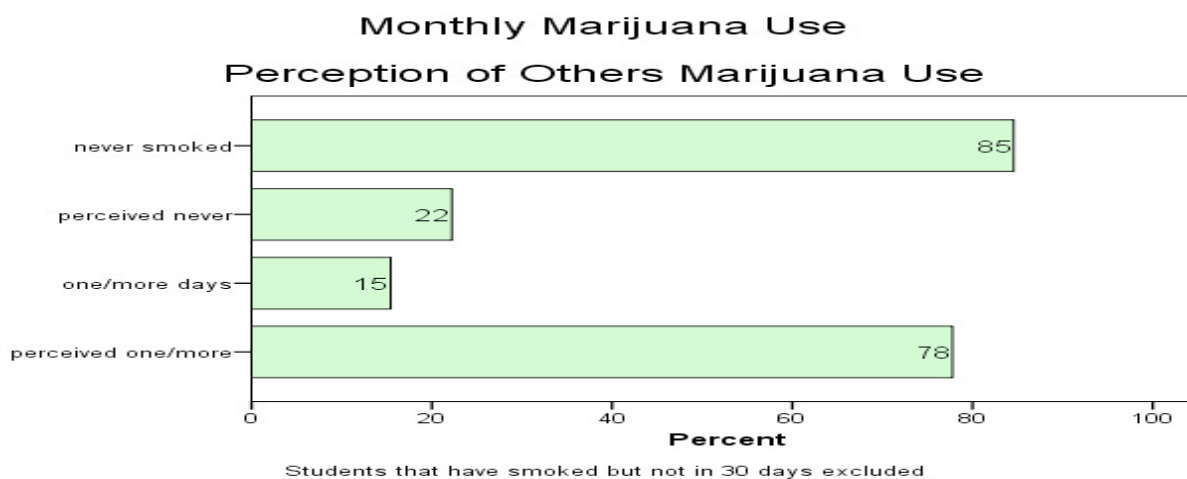
- Pharming Parties – everyone brings a prescriptive drug to share

- ADD/ADHD Meds – and the resultant use of these stimulants to get high and/or as study drugs
- The (small) rise of Meth – a drug that was less popular among the previous generation but is hardly used among students (and students that do use are not likely to remain students for long)
- Drinking & smoking rates lower than recent decades – something that may signal the need for broader prevention focus

In addition to the every changing world of drugs, these young people came of age as society was dealing with the other new (or resurfacing) health conditions SARS, HIV, West Nile Virus, Anthrax, Avian Flu, and Meningitis.

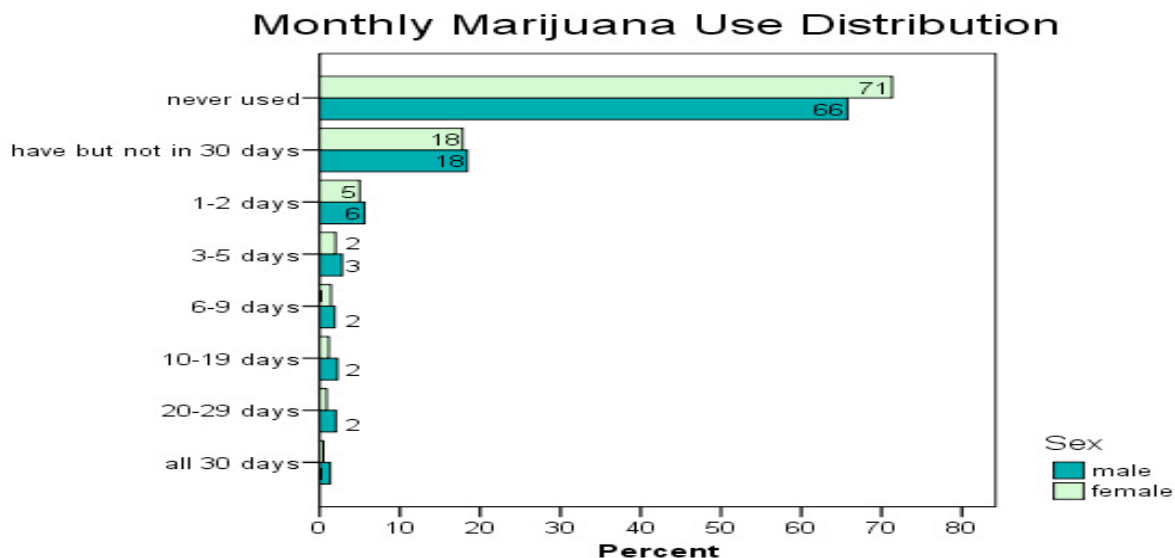
Drug culture on campus

To better understand what is happening on campus it is helpful to start by examining some data. The following charts and tables are drawn from the American College Health Association – National College Health Assessment (ACHA-NCHA), the CORE Institute, and the Substance Abuse and Mental Health Services Administration (SAMHSA).



Source: ACHA-NCHA, Spring 2006

As you can see in this first chart, there is a significant gap between what students perceive to be happening (78% perceived students smoked marijuana in the last month) compared with actual behavior (15% actually smoked marijuana in the last month).



Source: ACHA-NCHA, Spring 2006

This chart shows that the frequency of marijuana use is quite low among the students that did use marijuana in the last month. Additionally, this chart shows us that there appears to be no major behavioral differences by gender.

HOME RESULTS SURVEYS SERVICES CATALOG	PREVALENCE	
	Annual Prevalence	
	Tobacco	41.0%
	Alcohol	84.5%
	Marijuana	30.1%
	Cocaine	4.9%
	Amphetamines	6.4%
	Sedatives	4.4%
	Hallucinogens	3.5%
	Opiates	1.4%
	Inhalants	1.1%
	Designer drugs	2.7%
	Steroids	0.6%
	Other	2.0%
	The percentage is students who reported using each drug listed at least once within the year prior to completing the survey.	
	30-Day Prevalence	
	Tobacco	28.2%
	Alcohol	72.8%
	Marijuana	16.7%
	Cocaine	2.1%
	Amphetamines	3.3%
	Sedatives	2.0%
	Hallucinogens	1.0%
	Opiates	0.7%
	Inhalants	0.5%
	Designer drugs	0.8%
	Steroids	0.4%
	Other	0.8%
	The percentage of students who reported using each drug listed at least once within the 30 days prior to completing the survey.	

Source: CORE Institute, 2005

Taking a look at this chart we can see that outside of alcohol, tobacco, and marijuana very few students use other drugs. We can agree that not every category is here (like prescription drugs),

but this data does indicate that there is not a high level of illicit drug use (beyond marijuana or age-connected alcohol) among college students.

According to data from SAMSHA, over a four-year time span (2002-2006) there was a 16% drop in the use of illegal drugs by youth (12-17 yrs old). Among these drugs marijuana rates has the sharpest decline. It should be noted that marijuana rates also went down in the 18-25 yr old range (traditional undergraduate and early graduate school ages). Additionally, prescription drug use numbers are up – but we still see an overall small percentage of the population (6.4%) report using these prescriptive drugs improperly.

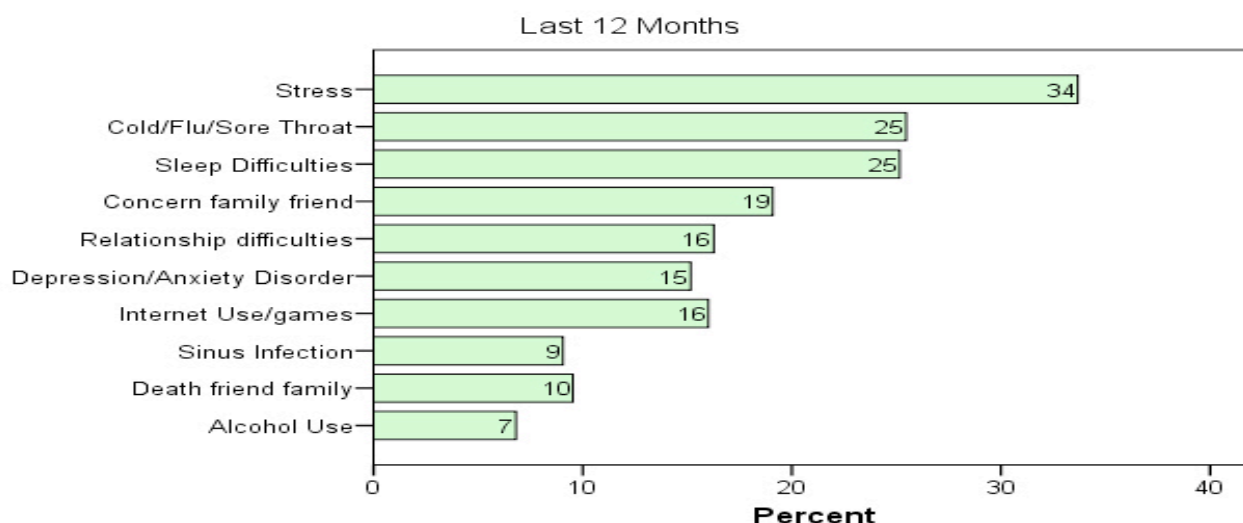
What does the data mean...

So by taking a look at this data we can get a better picture of what is happening on campus.

Using research definitions we get the following conclusions:

- Alcohol, Nicotine, & Caffeine are the only major drugs of use. Nothing else crosses a threshold over about 6 percent. Not that we should dismiss them, but the numbers tell us it is not a crisis.
- Marijuana use is almost one in five (20%). So if we want to be concerned with illicit drug behaviors, marijuana is the place to focus our attention. There are schools taking a more serious look at this issue with online programs like e-TOKE and the application of motivational interviewing to marijuana infractions.
- Nothing else has numbers of significance. Again, we should not dismiss the fact that some students will use other substances, but the data is clear that it will not be a very large group. In our work on campus we must educate administrator, faculty, and other students so that the campus climate does not perpetuate a false sense of reality (we all remember the drug problems, but we fail to notice when students don't use drugs).

Top 10 Impediments to Academic Performance



Source: ACHA-NCHA, Spring 2006

The results are in and the findings are not a shock. For starters, drugs (other than alcohol) do not make the top ten when looking at impediments to academic performance. That's not to say that there is no interaction, or that we should ignore drug issues, just that when health-related priorities are being determined, drug use is not going to be at the top based on quantitative data. This last chart is critical to this writer as our approach to addressing drugs on campus should be linked to the academic mission of the institution. Tracking other information may be helpful, but ultimately our field has a responsibility to keep the focus on helping students reach graduation. I refer to these folks as "future alumni" as they came to our institutions to earn a degree, not just take some classes (in most cases).

Emergent issues

The idea of emergent issues is an interesting concept. Many drug issues move in cycles; an idea that is supported by the transitional nature of the student status. There may also be significant geographical differences on the emergence of drug use behaviors on campus. For example, robotripping came to campus as an outgrowth of high schools students using this strategy to get high; ice (methamphetamine) initially gained a foothold on the west coast of the US before migrating east; and numerous drug behaviors took root in urban areas before commuting out to the suburbs.

So based on what has happened in the past, looking at some of the most recent qualitative and quantitative data, and talking with key informants across the US this writer offers the following possible areas to watch:

Technology for access – it is probably of no surprise that a generation that does not remember the days before e-mail, the Internet, etc will leverage these tools when seeking to learn about drugs and mechanisms to obtain them

Prescription Misuse/Abuse – there is enough information now to say that it is definitely happening, on and off campus. What we don't know is exactly how widespread the "problem" is, and we lack evidence-based practices to address it.

OTC Misuse/Abuse – like the point above our select population of drug using and dealing friends are clever, and thus seek new ways to achieve the effects of drugs. With over the counter (OTC) medications being so easy to obtain it is not a stretch to think that this are may warrant watching.

Methamphetamine – not likely to be a college issue, but it has captured the attention of the Department of Justice and many other governmental agencies. As such we are likely to continue to hear about it. If called upon to offer a prediction, this writer would say that meth is more likely to be something students make and sell than something students use.

Re-emergence of Cocaine – it's back, but not in big numbers and if the past has taught us anything it will not last very long. We should be prepared for some questions, but it is not likely to be the media-driven hype that was seen in the 1980s.

More medicated students than ever before – this is present across all of our society. What we have yet to learn are the implications being so medicated has for supporting student academic success and the ramifications for improper use of medications on campus.

While none of these potential areas to watch are expected to become wide-spread in higher education, these are the drug issues of emerging concern. As a field we need to keep track of what is happening and share the information with our peers.

Influence of celebrities

Based on the idea that there are some issues to watch it is not unusual to see people mention media and celebrities. Much has been debated around the effect that celebrities may have on young people and the choices around using or not using drugs. Here is a selection of celebrities that young people may associate with some drug issue: Britney Spears, Amy Winehouse, Heath

Ledger, Paris Hilton, Lindsay Lohan, Robert Downey Jr., Whitney Houston, Snoop Dogg, and Dr. Dre. Some of these “famous” faces have well documented troubles with alcohol or other drugs (or both), while examples like Heath Ledger provide reminders that the improper use of prescriptions (even if unintentional) can be fatal. There is also the emergence of television shows like *Celebrity Rehab* with Dr. Drew that may be sending an interesting message to young people.

This writer can't say with certainty that celebrities are having any causal factor in the decisions young people are making around drugs, but it is not difficult to imagine that the frequent drug images in the media provide the idea that it is both highly prevalent and potentially expected behavior. What can be said is that harm reduction messages and/or celebrity being leveraged as part of the solution (beyond the 1980s Nancy Regan messages) just does not seem to happen anymore.

Leveraging language

Have you ever heard part of a conversation and just had no clue what the students were talking about? It was not long ago that this writer overheard a male students say “if I just had an Easy Bake Oven it would all be ok.” Yeah, no clue on that one either. If you really want to be entertained on language, check out the Overheard on Campus groups that exist online.

What can be learned is that language is an essential part of the work we need to be doing to address the use of drugs on campus. It is critical for prevention professionals, faculty, administrators, peer educators, and anyone else working on campus to understand what students are talking about.

Given the rise in online communities, social networking, and Internet-based technologies this writer did a quick search on three sites known for heavy student traffic. Using a couple of well know “drug” terms you can quickly identify the following:

- From Myspace.com search the term “420” and find 1175 groups
- From Facebook.com search the term “420” and find 500+ groups
- From Craigslist.org search the terms “skiing” and “parTy” and find thousands of hits

If you are unfamiliar, 420 refers to marijuana (420 friendly, etc), skiing refers to using cocaine (ride the slopes, etc), and parTy refers to using methamphetamine (Tina, crystal, etc).

By having a better understanding of the language being used around campus and community we are in a position to really comprehend the full story. We can also use that understanding to help gather first-hand accounts of student drug use and develop more targeted prevention messages. At the same time, let's not try to be too cool. That's the first sign that we just don't get it!

Trends?

So are there really any trends we can identify? The reality of this field is that our best research often lags several years behind the behavior we want to address, and as such by the time we have good information the trends may have shifted. That being said, and drawing from more qualitative understandings the following ideas seem to warrant some attention in higher education right now (keeping in mind that we are still talking about a small number people that are likely to “do” these things).

- 1) Study Drugs – students may have a growing an interest in substances that provide a competitive edge. Specifically the stimulant drugs for ADD/ADHD that reports say are being used for all nighters, focusing in busy times, etc. Couple this with the increasing number of students coming to campus with prescriptions for these medications and availability and opportunity abound. On a related note, there is the occasional mention of using medications like albuterol (asthma inhaler) among athletes seeking an edge.
- 2) Pharming - this refers to the improper use of prescription and over the counter medications. Like the study drug issue (which is an example of pharming), other medications include erectile dysfunction medications, sedatives, sleep aids, and products used as a base for producing other substances (making meth, etc).
- 3) New issues – Building on the idea of increasing medication use as new students arrive on campus, the potential availability, and the ever present direct marketing of medications to a consumer and it is entirely possible that the real trend will be the rapid change in the new drug issues. We simply don’t have data collection mechanism that move as fast as interest in new drugs. Think of it this way, we will always be one step behind the innovators in drug use on campus.
- 4) The Return of Old Favorites – for those of us in this field long enough we have seen some medications come round in cycles. There is a resurgence in clothing styles from the 1980s and some renewed interest in cocaine. I am not saying they are causal, or even related, but both are coming round again. A fairly recent listserv question asked about this new drug called sativa. Unless we sent that e-mail more than 30 years ago, it’s not new. We just have younger professionals that have not seen or heard about it.

Applying it to the campus level

When it comes to working with these issues we must always bring it home, to campus. For starters, remember the mission of the institution. If your campus is anything like the rest of them, academics is a primary focus. That said, how are you looking at issues of drugs and the connection to the classroom? Do you know what drug issues are impacting student

performance? How do we know? Refer back to the Impediments to Academic Performance table presented earlier.

So, then what is on the minds of students? Are there big discussions about what “everyone is doing?” Referring back to the marijuana data presented earlier, students tend have a significantly skewed view of drug use behavior on campus. As a result it is our responsibility to address the issues of perception vs. reality.

To begin the process of addressing these issues on campus we should start with developing a local understanding. Have you done a walkabout on campus to see what can be observed, what you overhear, what “supplies” you can find? Have you talked to the key opinion leaders (and not just elected student leaders)? Have you explored the campus and community connections that might fill you in? Here are some on and off campus resources for gathering information, discussing this issue, and developing a strategy for how to address drugs on campus:

ON CAMPUS	OFF CAMPUS
Dean of Students Office of Judicial Affairs Residence Life Faculty Campus Police Students Online Networks	Local Drugs Stores/Retailers Hospitals Police Agencies Bar Owners Campus/Community Coalitions Area Schools

Regardless of the approach chosen when addressing drug use on campus, making logical data driven decisions (including budget, program, and service), not being carriers of misperceptions, and maintaining a mission-driven focus are key elements to help ensure success.

Resources

There are many terrific resources available to assist campus professionals in learning about and addressing drug issues on campus. Here is a selection of this author’s favorites:

- **Go Ask Alice!** – Contains a searchable archive of thousands of health questions asked over the past 15 years. Features an Alcohol, Nicotine and Other Drugs Category. www.goaskalice.columbia.edu
- **Erowid** – this online community is primarily a pro-drug site with active users describing her/his experience. Does contain some claimed “science” related to some drugs and provides some harm reduction information. www.erowid.org

- **Higher Education Center – Effective Programs** – this site offers a listing of alcohol and other drugs programs that have some evidence of effectiveness.
www.higheredcenter.org/pubs/effective-prevention.pdf
- **US Department of Justice** – this US governmental agency offers information and resources related to a number of drug issues. May be helpful for working with law enforcement. www.usdoj.gov
- **White House Office of National Drug Control Policy** – another US governmental organization that offers tools and resources to assist prevention efforts. They publish a terminology document that many find helpful, though it is not updated on a regular basis.
www.whitehousedrugpolicy.gov
- **Urban Dictionary** – contains a searchable index of terms. This resource is useful when encountering a term with an unknown context or meaning. www.urbandictionary.com
- **Snopes** – this urban legend website is a terrific tool for helping de-bunk myths associated with a number of issues. Provides a background on the “story” and references related to the investigation. www.snopes.com
- **Monitoring the Future** – a terrific data source on middle and high school student’s alcohol and other drug use behaviors. Can also be used to look at trends in drug use.
www.monitoringthefuture.org
- **ACHA-NCHA** – a college –specific data source that can be used on the campus level or you can review the national aggregate data online. www.acha-ncha.org
- **CORE Survey** – an alcohol and other drug specific survey for higher education, this instrument has been widely used in the US and provides aggregate reports online.
www.siu.edu/~coreinst
- **DAWN** – using emergency room data from a sampling of places this tool provides insight into the drug issues that are resulting in hospital visits (primarily in urban areas).
dawninfo.samhsa.gov

References

- American College Health Association. (2007). American College Health Assessment – National College Health Assessment Web Summary. Available from www.acha-ncha.org
- Andes, S. & McNeil, M. (2007). The Millennial Effect on College Health Promotion. Annual Meeting of the American College Health Association. New York, New York.
- Coomes, M. D., & DeBard, R. (2004). A generational approach to understanding students. In *New Directions for Student Services* (pp. 5-16).
- Core Institute. (2005). Drug Use Prevalence Data. Available from www.siu.edu/~coreinst
- Howe, N. & Strauss, W. (2000). *Millennials Rising: The Next Great Generation*. Vintage.
- McNeil, M. (2008). I Said No To Drugs...But the Drugs Wouldn't Listen. Meeting of the Minds. Kansas City, Missouri.
- Substance Abuse and Mental Health Services Administration. (2007). 2002-2006 National Survey on Drug Use and Health. Available from www.samhsa.gov

About the Author

Michael P. McNeil is the Assistant Director of the Alice! Health Promotion Program, part of Health Services at Columbia University in New York. He is past chair of the Alcohol, Tobacco and Other Drugs Coalition and Health Promotion Sections for the American College Health Association, Downstate NY Coordinator for The BACCHUS Network, and has written and presented numerous articles and presentations on alcohol, tobacco, and other drugs over the past 15 years. He can be reached at mm3117@columbia.edu